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THE IRON AGE



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In This Issue...

INDUSTRY, now partly powered by war, some day will find itself again depending wholly on the driving power of peace. This week, **THE IRON AGE**, founded during the Crimean War of 1855, warns still another generation of war's dangers and the inevitable heavy costs of reconstruction. Today is not too soon, writes J. H. Van Deventer, editor-in-chief, for American industry to

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TORN at home by a political conflict which makes the 1940 presidential election the most significant of our times, and tattered by the wild, uncertain winds of foreign wars, industry finds itself fighting to gain a clearer view of an uncertain future which C. E. Wright, managing editor, and **THE IRON AGE** staff appraise in

The Outlook for Steel Page 52

ONE GOAL business leaders of the nation would like to reach next year is labor peace, an objective to be threatened soon by clashes over the check-off of union dues, the closed shop and efforts of radical union leaders to control factory production rates—all thorny problems which James A. Rowan, news editor, describes in

The CIO Still Labors Page 62

OVERHANGING industry is the question: How big are inventories? A national survey of large and small steel consumers in 15 industries, conducted by Don R. James, Cleveland editor, gives the answer—which you will find in

Inventories—Normal or Excessive? Page 66

THE FUTURE can possibly be appraised from past performance. What is the pattern being followed by major steel consuming outlets? At what production rate is profit a maximum? What dangers lie before the steel industry? An effort is made to answer these pertinent questions by T. W. Lippert, metallurgical editor, in

Steel Page 70

DICTATORSHIPS, often displacing democratic government when a country is gripped by war, are feared by millions of Americans whose sentiments against involvement in foreign conflict are so strong that Congress may act to curb the President's powers. L. W. Moffett, Washington editor, analyzes the situation in

Executive Powers Threaten Industry Page 80

ARMING hastily in a world where only the strong are secure, the U. S. next year will lift its rearmament budget to an unprecedented peace-time figure, James G. Ellis, assistant Washington editor, declares in

Uncle Sam Shines His Armor Page 82

FOR the first time in the nation's history, industry watches a 10-yr. period end with a total steel ingot production below the preceding decade. Read

**Steel Makes a New High But
Decade Shows a Heavy Loss Page 87**

FAR better off than other nations, we still are not self-sufficient in all metals, hence some shortages and price advances may be ahead, Adolph Bregman, consulting engineer, concludes in

**Non-ferrous Metals and Strategic
Position Page 98**

HOW industrial activity in the last half of 1939 was spurred by nations preparing for war or already fighting is shown in

World Steel Output Page 102

TO EQUIP the armies and fleets, makers of metal-working machinery have been flooded with the greatest volume of export orders since 1917, a story that Frank Oliver, associate editor, tells in

Mars and Machine Tools Page 106

EXPERIENCE gained during "tortured thirties" should help industry now, J. R. Weaver, of Westinghouse Electric & Mfg. Co., hopefully reminds us in

Depressions Challenge Management Page 112

ONCE little more than a repair process, welding has become a major method of production, R. E. Miller, machinery editor, writes in

Welding Serves Industrial Upswing Page 114

SOUTH America's growing importance as an outlet for U. S. industry gets deserved attention in a story by L. M. Lind, chief, machinery division, United States Bureau of Foreign and Domestic Commerce, entitled

Machinery in Latin America Page 120

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STOP



LOOK

AND LISTEN

By J. H. VAN DEVENTER

WAR, whether it be at home or abroad, is a great stimulator of activity. It pushes up operating rates and sales curves as effectively as streptococci push up a fever chart. And with quite comparable after-effects!

That is something for "activity minded" people to think about. There are still some activity minded executives left in industry, for example, who do not yet correctly distinguish between a healthy, normal business rise and a fever.

Fortunately, there are not so many executives of this type today as there were 23 years ago. Then, we had not been war seasoned. We knew how to figure our factory costs, but not the cost of war.

Forty-two billions of dollars! That is what the part we played in the World War cost Uncle Sam and the citizens of the U. S. A.* And that did not count the losses of private companies, their stockholders and their employees; companies which caught the "expansion craze," doubled and tripled their capacity, stopped thinking

about selling their legitimate peacetime products and concentrated their energies on an ephemeral war demand. If such losses could be figured they, too, would run into the billions, for they would include the cost of the great recent depression which has been exacting deferred time payments. So much for our World War adventure.

In view of this experience, I think a note of caution is the wise one to sound. It is time to "Stop, Look and Listen."

And this applies whether we get into the present controversy (which we hope he will not) or stay out of it. If we get into it, our executive industrial problems will be simplified, because it will be a case of regimentation and hence "stop, look and listen" for orders from Washington. If we stay out of it, it will still behoove the business executive to stop, look and listen for guidance from above or below or wherever else he can find it.

Something that we should think about is what is going to happen to us after this war is over. In what sort of a competitive world position will it leave our manufacturing industries?

In this connection, I am reminded of the little story of the ingenious machine builder who devised and built much better machines than anyone else could, so much better that his competitors were always keen to buy them. Demand was so great from his competitors that he could not spare the time to make these machines for his own plant. The result was that before long his competitors were so much better equipped with respect to producing capacity and costs that they ran him out of business!

For the past five years, and now more intensively than ever, our capital goods makers in the United States have been busy putting our foreign competitors in a position to lick us in world markets. Well over half of all of the machine tools, for example, that have been made in this country during the past five years have gone abroad. This is not, of course, the fault of the builders and sellers of these tools, who undoubtedly would have preferred to see them go into American shops. But nevertheless it raises the question as to what these improved tools are going to do to compete with perhaps less modern ones in this country after the abnormal de-

*From a report by the U. S. Secretary of the Treasury, 1934, estimating our cost of World War participation.

mands of war and armaments have ceased abroad.

Combine this tremendous overhanging surplus production capacity of the most efficient manufacturing equipment with the distressed wage situation, which will undoubtedly ensue in most countries abroad and I think you will find a threat which may well make American Industry "Stop, Look and Listen."

The Cost Factor Is All Powerful

There is no competitive factor as powerful as cost, given equal quality. Even if we should now capture a large portion of South American trade, for example, and hold it while our competitors have their backs turned, after the war is over the lower costs abroad will eventually take the business away from us.

For guidance in such an impending situation, I think the answer is almost self-evident. The cost factor has more or less determined in the past whether or not one stays in business or goes out of it. Whether or not one makes a reasonable profit for a period of years or just scrapes along on the bottom. Executives can count with assurance on a greatly magnified importance of the cost factor after this war is over. It will apply to our national industrial economy and manufacturing capacity as a whole and also to individual plants and companies at home. We are going to see a domestic cost-cutting campaign during the next five years which will be more intensive, more widespread and more important in its effect than any similar campaign that has been carried out by American industry during its comparatively short history.

If these assumptions are true, and to me they seem self-evident, then it is a matter of the utmost importance for our industrial executives to put

their plants in shape to meet the demands for lower cost products that will come from world competition and from increasing taxes and other uncontrollable cost factors at home.

The Next Buyers' Market

Within the two weeks' period immediately after the declaration of this new European war, a buyers' market of 10 years' duration in the United States was suddenly transformed into a sellers' market. But it was not a normal sellers' market which is due to a shortage of normal peace-time products and broadly distributed excess purchasing power to buy them. It was a sellers' market for the products and services which are primarily essential for the abnormality of war.

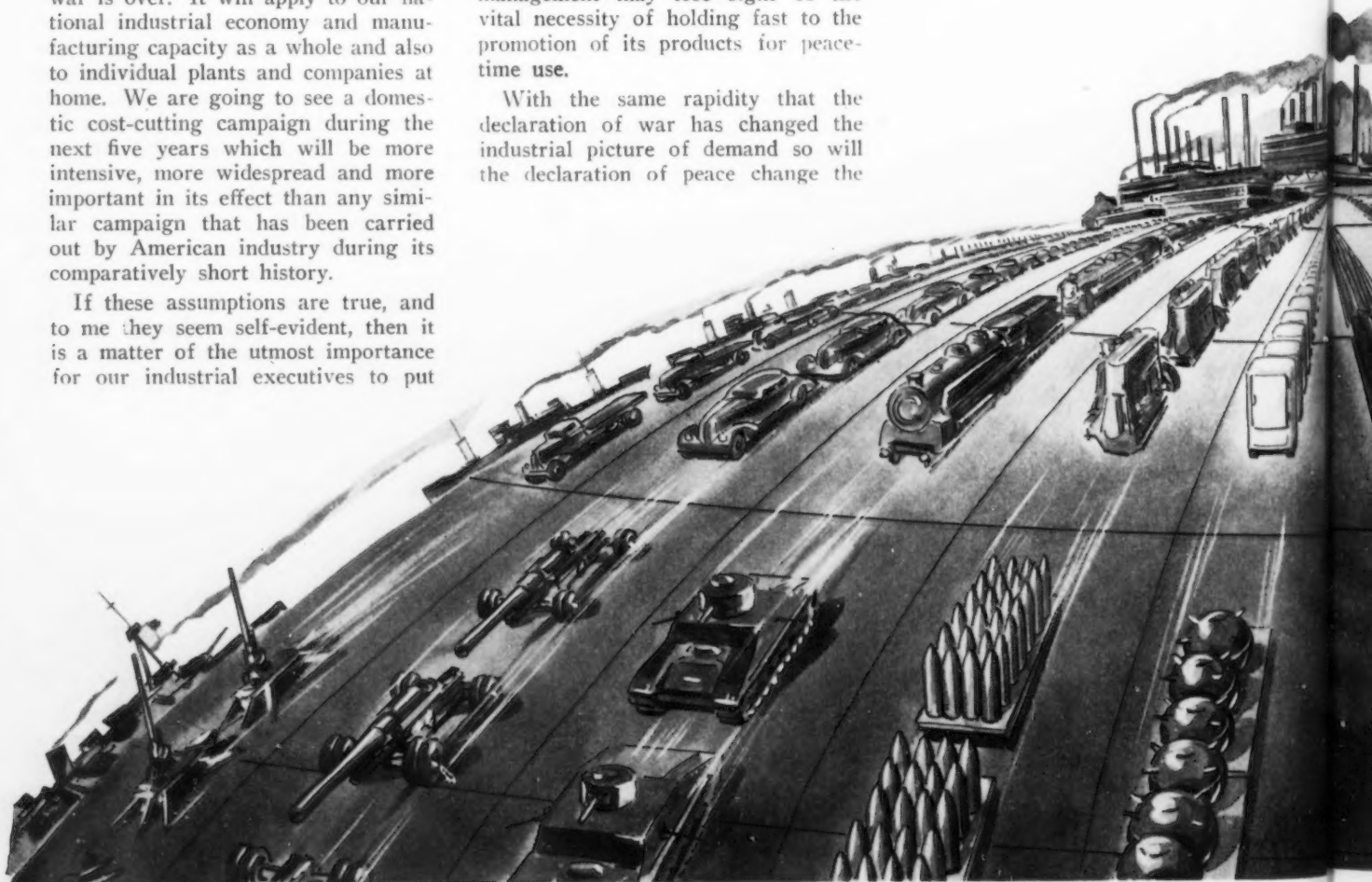
The big thing for American industrial executives to keep in mind now is that war demands are abnormal and not normal. The normal function of industry is to promote the normal and natural use and enjoyment of peace-time products. Of machines, products and services, if you please, which create wealth and not those which destroy it. The danger of the present situation and what may follow it is that in a sellers' market, induced by the abnormality of war, management may lose sight of the vital necessity of holding fast to the promotion of its products for peace-time use.

With the same rapidity that the declaration of war has changed the industrial picture of demand so will the declaration of peace change the

situation when it comes. That is something for us all to consider.

War has taken nearly 100 of our merchant marine vessels and put them at idle anchorage. It has completely, in a few days, changed the entire picture of the shipbuilding industry. For the past two years, shipbuilding has been one of our most active occupations. Our shipbuilding yards on the Atlantic and the Pacific and the Gulf of Mexico have been fully occupied with construction programs extending far in advance. But a war is suddenly declared. A war with which we are not immediately concerned. And what happens? Immediately the picture and the perspective of American shipbuilding are radically altered. Ten days before this declaration we had a deficit of shipping tonnage. Ten days afterward, we had a surplus. That is what war does to industries even across the world from it.

And take the airplane construction business. The same force, or forces, that put thumbs down on the American shipbuilding industry and put so many of our ships out of commission stimulated the aircraft industry of America far beyond the limits of normal demand or growth. Overnight



almost, we find the spectacle of a mushrooming industry. A mushrooming that threatens labor displacement and a dislocation of normal economic relationships which will suffer as marked and abrupt a dislocation when the demands of war are over as the shipbuilding industry.

The Abnormal Is Always Ephemeral

"Stop, Look and Listen." Remember, Mr. Industrial Executive, that war demands are abnormal and not a normal procedure. Unless you hope to make all of the profit you care to make within the next few months and then retire from business, you will have to look forward and lay your plans to a resumption of the peacetime activities in production and selling which have no immediate relationship to war.

Under those circumstances, it seems to me to be point No. 1 for the insurance of future profits and perpetuation of your business to see to it that normal skills are not lost, that normal organizations are not broken up, that normal approaches to your normal market are kept established through the proper promotion and selling efforts even in a sellers' mar-

ket. The experiences of many concerns in the last war are such as to give pathetic and eloquent warning to present-day industrial executives. Some of these concerns forgot their old customers in pursuit of new ones. But the new customers, although they talked in magnificent terms, were as ephemeral as the moths and butterflies which appear and dazzle us by their brilliance only to disappear so quickly. Do not lose sight or touch of your old customers, your old products and the buying habits of peace.

The Price Problem

Another of the great dangers of the war repercussion is its effect upon the price structure. So far, America has handled this problem admirably. Private industry has demonstrated its ability to think in terms of public welfare and to act in accordance with it when dealing with price level stabilization.

Private industry is to be credited with this statesmanship. For, after all, as yet, the control of prices lies in the hands of industry, not in the hands of Government. And while a number of the more vociferous New Dealers in Washington have made plenty of noise about prices, private enterprise had even previously done something about them. It has kept them from going up. Even that policy should be continued, for, if we once allow prices to ascend on the up spiral, we are going to encounter an endless chain of vicious and damaging effects. Among them will be increased

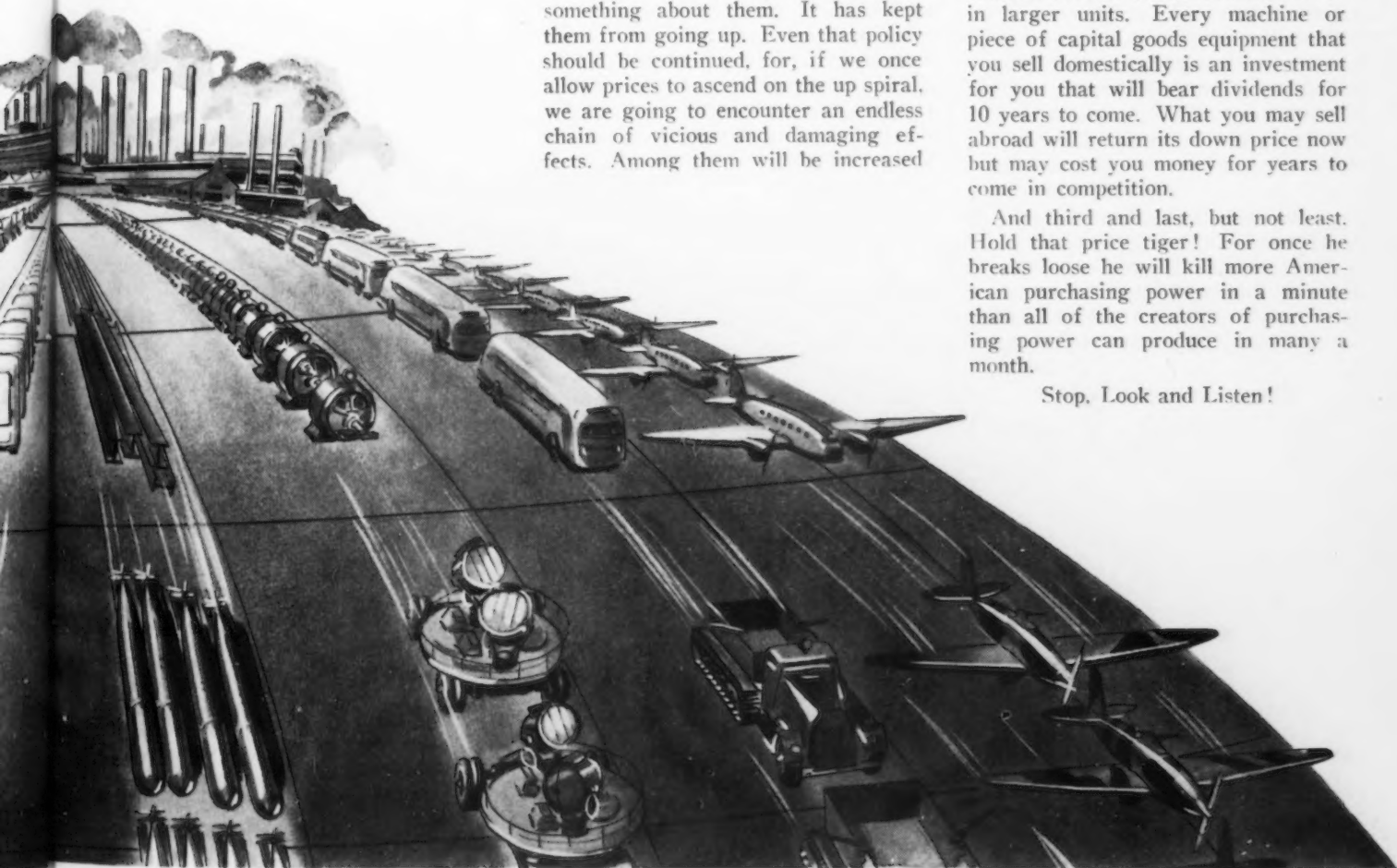
wages, increased taxes, increased costs and a gradual dwindling of consuming power. Also, the further up the prices are permitted to move under the inflationary influences of war, the more drastic will have to be our cost reductions to compensate for this maladjustment in the days to come. The further the fall the greater the bump!

Three principal points I make in this appeal to American industrial executives to *stop, look and listen*. First is to formulate and execute reequipment policies looking to the attainment of a lower cost level. Get the economies out of machines, which have no purchasing power and not out of wages. For wages constitute the major part of our American buying power. Get in line for the period of competition that is coming and that will test your ability to keep your place in the American industrial picture and that will also test our national industrial ability to keep a place in the world's market place.

The second point is to plan and execute with equal vigor the promotion of your peace-time products through your normal peace-time channels of distribution. Do not permit your dealer organizations at home to dry up and blow away because you can sell abroad at less commission or in larger units. Every machine or piece of capital goods equipment that you sell domestically is an investment for you that will bear dividends for 10 years to come. What you may sell abroad will return its down price now but may cost you money for years to come in competition.

And third and last, but not least. Hold that price tiger! For once he breaks loose he will kill more American purchasing power in a minute than all of the creators of purchasing power can produce in many a month.

Stop, Look and Listen!



The OUTLOOK for

WITH a war raging in Europe and a Presidential election in the United States which political analysts predict may be the most momentous for the country since 1912, prognostication as to the course of business in 1940 becomes an undertaking from which even soothsayers and astrologers might shrink.

Events at home and abroad which may have a vast influence on shaping American business this year are unpredictable, yet there are some definable factors from which a general, if not a specific, pattern for the new year may be drawn.

The overall influences will obviously be the war and the election. Thus far the character of the war itself and the character of the buying that has been done in the United States by the belligerent countries do not suggest the possibility that this country will be flooded with orders as it was during a greater part of the World War period. The possibility that the United States may be the principal supplier of the steel requirements of neutral nations throughout the world is, however, a factor with which to reckon in appraising 1940 prospects.

Election Year Influences

Influence of the Presidential election on business is problematical. It is a mistaken idea that a Presidential election is necessarily bad for business. None of the Presidential election years after 1908 up to 1932 was a poor period for the steel industry. In retrospect it would appear that conditions outside of the election itself influenced the course of business. The year 1908 was bad as the country was just emerging from a depression, but in the subsequent election year, 1912, the steel industry made a new high record. The year 1916 was of course a boom period owing to World War demands. Another boom year was 1920, although business had slumped sharply by the time election day rolled around. In 1924 there was a moderate slump, but

steel production averaged 63.8 per cent as compared with 76.6 per cent in 1923 and 74.2 in 1925. The worst period in the history of the steel industry was 1932, but the conditions then could hardly be ascribed to the fact of an election. The election year 1936 was the best, with the exception of 1937, that the steel industry has experienced in the 1930-1939 decade.

Not to minimize the importance of the coming election from an economic and business point of view, the superstition that a Presidential election may be bad for business is untenable, particularly in a period when counter influences may flow from world conditions brought about by the war in Europe.

While this year's election may not have an adverse effect on business, considering the other influences, it is reasonable to expect that certain political results might have a stimulating effect. A more conservative trend in Congress followed by the nomination of a conservative Democrat who would be opposed to some of the more radical tendencies of the New Deal could conceivably restore a rejuvenated spirit of business enterprise which might be the forerunner of the long-term planning that has been conspicuously lacking in recent years. From this point of view the results of the election may be a determining factor in prospects for the steel industry not only in 1940 but in subsequent years.

Lower Steel Rate Expected

IN considering the prospects for 1940 it seems to be obvious that a prolongation of the record-breaking production of the final quarter of 1939 is not to be expected—at any rate not beyond January or February. Apart from 1929, when the steel industry operated for eight consecutive months at 90 per cent or higher, production of steel at such high rates has never been equaled since the World War for more than one month at a time. In fact, 90 per cent operation was equaled or exceeded in only three months of the en-

tire post-war period (excepting 1929) up to the fourth quarter of 1939, namely once in 1926, once in 1927 and once in 1937.

Moreover, the fact that more steel was manufactured in the three final months of 1939 than in any other similar period in our history proves quite conclusively that a letdown is inevitable. Thus those who have been predicting a lower volume of steel production some time in the early part of 1940 are not gifted with omniscience, but are merely voicing an obvious conclusion.

The extent of a probable decline in steel production is a matter, however, about which there has possibly been too much pessimism, which has been engendered by fears of the building up of excessive and burdensome inventories not only of finished steel itself but products made of steel. The matter of inventories is dealt with factually in another article in this issue which is based on reports from a large number of metal-working manufacturers, but for the purpose of this analysis it should be stated that the situation has obviously been misinterpreted, particularly by economists and other commentators outside the industry. From a policy of hand-to-mouth buying, which frequently did not provide for more than two or three weeks' supply of steel, because deliveries from the mills were usually available in about that time, most of the manufacturers in the country who use steel were forced by circumstances into a position where common prudence dictated that inventories sufficient for three months or more of manufacturing operations should be acquired. That a portion of the steel produced in the past three or four months has gone into the building up of such inventories goes without saying, but there is no evidence that such inventories for the present conditions have become so excessive as to serve as an overhanging threat to the continuance of at least moderately good steel business.

STEEL

By C. E. WRIGHT

A drastic change in the present situation, such as a sudden ending of the war, would undoubtedly be followed by a period of at least a few months in which steel consumers would gradually return to a basis of smaller steel stocks, but until that time arrives the factor of safety will continue to dictate that consumers and distributors keep their stocks at least two or three months ahead of the mills. If the delivery periods for various steel products should shorten to a matter of a few weeks, steel users probably would gradually adjust their stocks to the easier situation, but this process probably would be gradual until such time as consumption and production of steel were in closer balance.

Steel Consumption Rising

THAT consumption of steel has increased materially during the period of rising production is a factor that is sometimes not given proper weight. The crux of the problem of inventories and consumption seems to lie in the rapidity with which goods manufactured from steel are moving to the ultimate user.

In many important lines of steel consumption there can be little or no doubt on this point. The automobile industry, foremost consumer of steel, gears its production of cars to the demand, and the demand has been good. In the case of the railroads, which have been taking and will continue to take a lot of steel during the coming months, they are the ultimate consumers. The steel they have bought is going into cars, locomotive and track maintenance. Whether the railroads will supplement their recent purchases with similar large orders when work now on the books is completed a few months hence remains to be seen; that probably depends on the trend of carloadings and the general business picture. That the railroads still have far to go to complete the rehabilitation or replacement of existing equipment is

a factor of potential demand; circumstances will prescribe just when additional work shall be undertaken.

The container industry has been one of the busiest among the various classifications of important steel users. This applies to large containers for oils, chemicals, etc., demand for which at home and abroad has been greatly stimulated by war conditions, and to tin plate for food containers, in which similar influences have been at work.

Many miscellaneous industries have been stimulated by export trade, Government defense work and the psychological influences that have accompanied the changed conditions abroad. Many consumer products made of steel are in an improved position due to increased home building and to greater and more profitable employment.

The construction industry sees a larger volume of work ahead of it in 1940 than it had in 1939 notwithstanding that much of the PWA program has been completed or is approaching completion.

It may be that the difference between a good year and only a fairly good year will rest to a large extent on the volume of the foreign demand. However, business was obviously in an upward cycle some months prior to the war, which sharply intensified the movement. The trend of steel production was ascending rather sharply in July and August and the year as a whole undoubtedly would have recorded a total ingot output of 40,000,000 tons, the estimate of THE IRON AGE a year ago, even without the influence of the war.

Steadier Trend Probable

A MORE even and steadier trend of business and production may logically be expected in 1940. The present indication seems to be that January and February will come somewhere near the top of the cycle as the still heavy backlogs on mill books are worked off. The consensus of opin-

ion seems to be that the first quarter, with a possible average steel output of about 80 per cent, may be the best period of the year. The second quarter is expected to average somewhere from 70 to 75 per cent, and the third quarter about 60 to 65 per cent. Beyond that few are willing even to hazard a guess, so much depending on the turn of events during the year in Europe and in political developments in the United States.

Such predictions as can be hazarded for the first half or the first three-quarters of the year are based on certain factors which are at present known or can at least be reasonably surmised. For example, it is known that a good deal of the railroad tonnage still on mill books will be produced and shipped during the first three or four months of 1940 and that additional tonnage from the railroads in like amount may not be available for the second quarter. However, the early part of the second quarter is usually a good period for automobile tonnage as the crest of spring automobile production is likely to come in May. Moreover, the manufacturing season for 1940 models may extend later than usual, if business holds up, because of the probability of minor changes in 1941 models, a situation forced upon the motor car companies because of inability to obtain deliveries of new machine tools that would be required for major changes.

What of Foreign Demand?

ALL calculations for the coming year must, however, be qualified by the unpredictable factor of foreign demand for our steel. It is to be expected that a prolonged war will result in a broad expansion of exports and further restriction of imports. Eventually there will undoubtedly be much heavier shipments of steel both to belligerents and to neutral markets from which nations at war have had to withdraw entirely or partially because of pressing need of all or most of their

own capacity. After the flurry of September and October the demand from abroad settled down to a more orderly procedure, but the crippling effects of more serious warfare, particularly on sea-borne commerce, will tend to drive more steel trade to the United States, in addition to which the continued threats to neutral countries are causing them to strengthen their own defenses, which will require more of their own steel and less for export.

Whatever demands are ultimately made upon the United States for steel, they may not attain the volume of the World War, but they may be sufficient

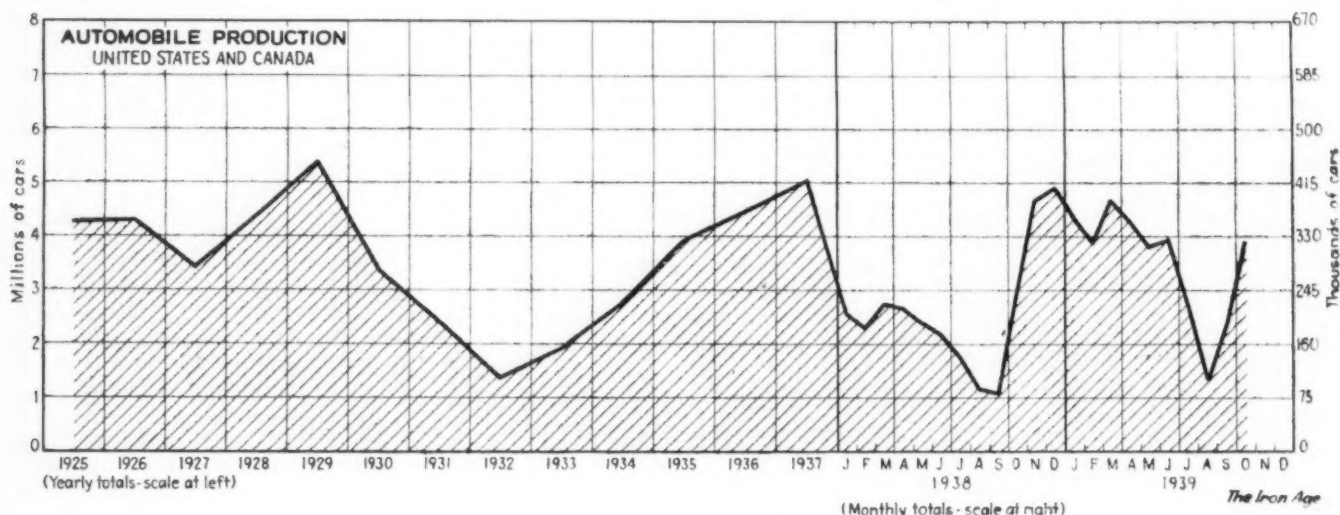
Gain Over 1939 Possible

ASSUMING that the war continues through 1940, it would seem certain that normal peacetime requirements at home plus such foreign business as may develop will bring an increase in the total steel production for the year of at least 10 per cent over 1939, which would mean a 1940 output of around 50,000,000 tons of open hearth and bessemer ingots against nearly 46,000,000 in 1939. This would mean an average operation for the year of about 70 per cent as compared with 64½ per cent in 1939. The tonnage is likely to be better distributed

throughout the year, with the possibility, however, that the first half may be better than the last half.

A sudden ending of the war at some time during 1940 would not necessarily be catastrophic for the American steel industry, although a few months of hesitation and uncertainty might ensue.

The various factors in the domestic situation which will contribute to the results expected for 1940 are analyzed in appended reviews of important steel consuming channels by members of THE IRON AGE staff.



HAMPERED by numerous labor strikes, the 1940 model year got off to a slow start and output for 1939 as a whole was about a million cars below the 1937 total. Evidence of sustained buyer interest in the new models and the improved business conditions may make 1940 a 4¼ million-car year. *Graph data source: Department of Commerce.*

nevertheless to be an important factor in our steel situation during the coming year. These demands may be relatively greater from neutral countries than from the belligerents. One reason is that the Allied armies are using little munitions as compared with the huge quantities expended during the World War; another is that the Allies have increased their steel-making facilities since the World War and are more nearly self-contained than they were at that time; moreover, the Maginot Line now protects the French steel industry, which was rendered partly impotent during the previous war. Still another reason is that the combined purchasing plan of Great Britain and France will prevent unnecessary and wasteful duplication of orders and will serve as a price check as the two countries will not be bidding against one another for the same supplies.

AUTOMOTIVE

By W. F. SHERMAN

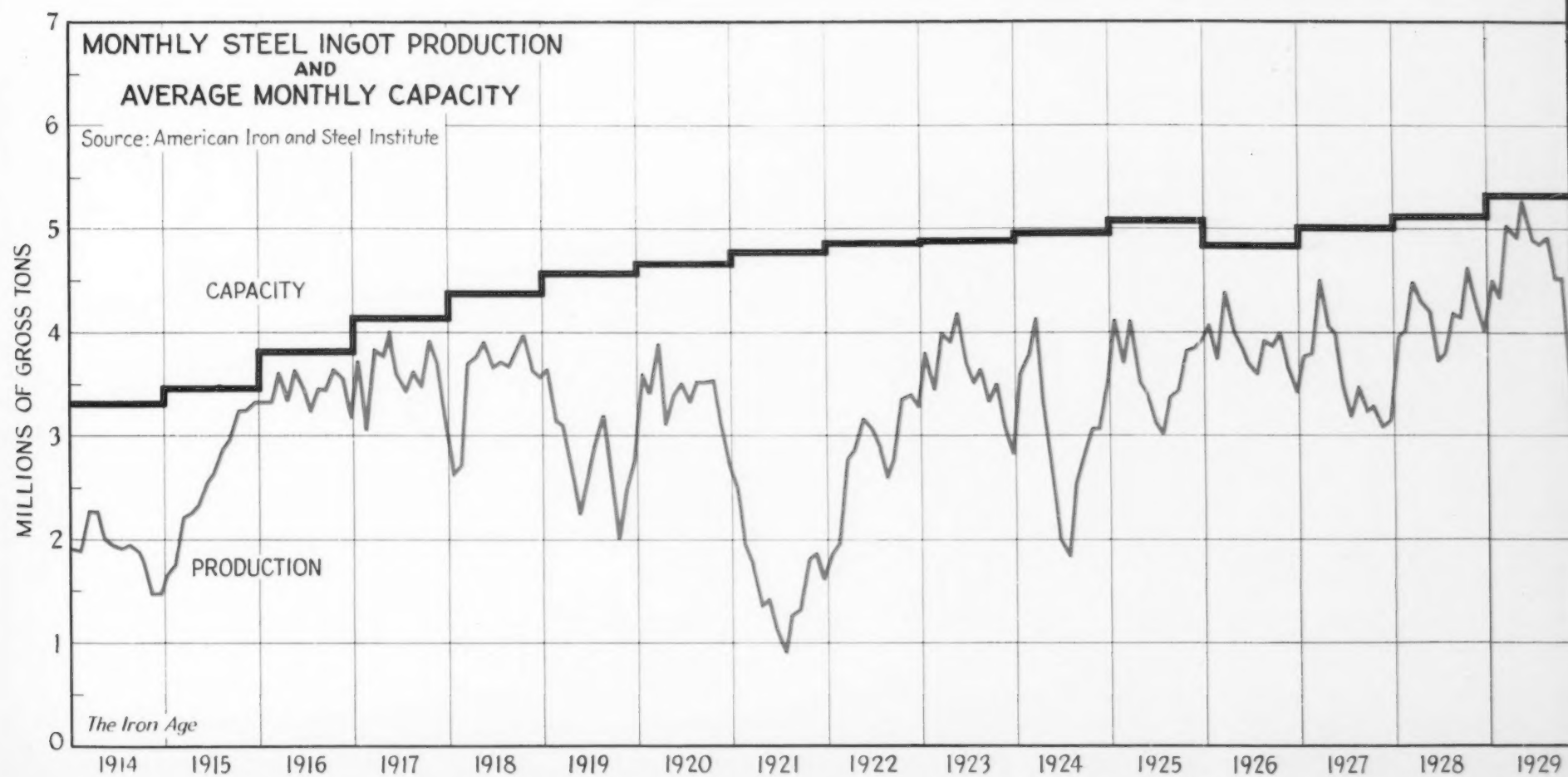
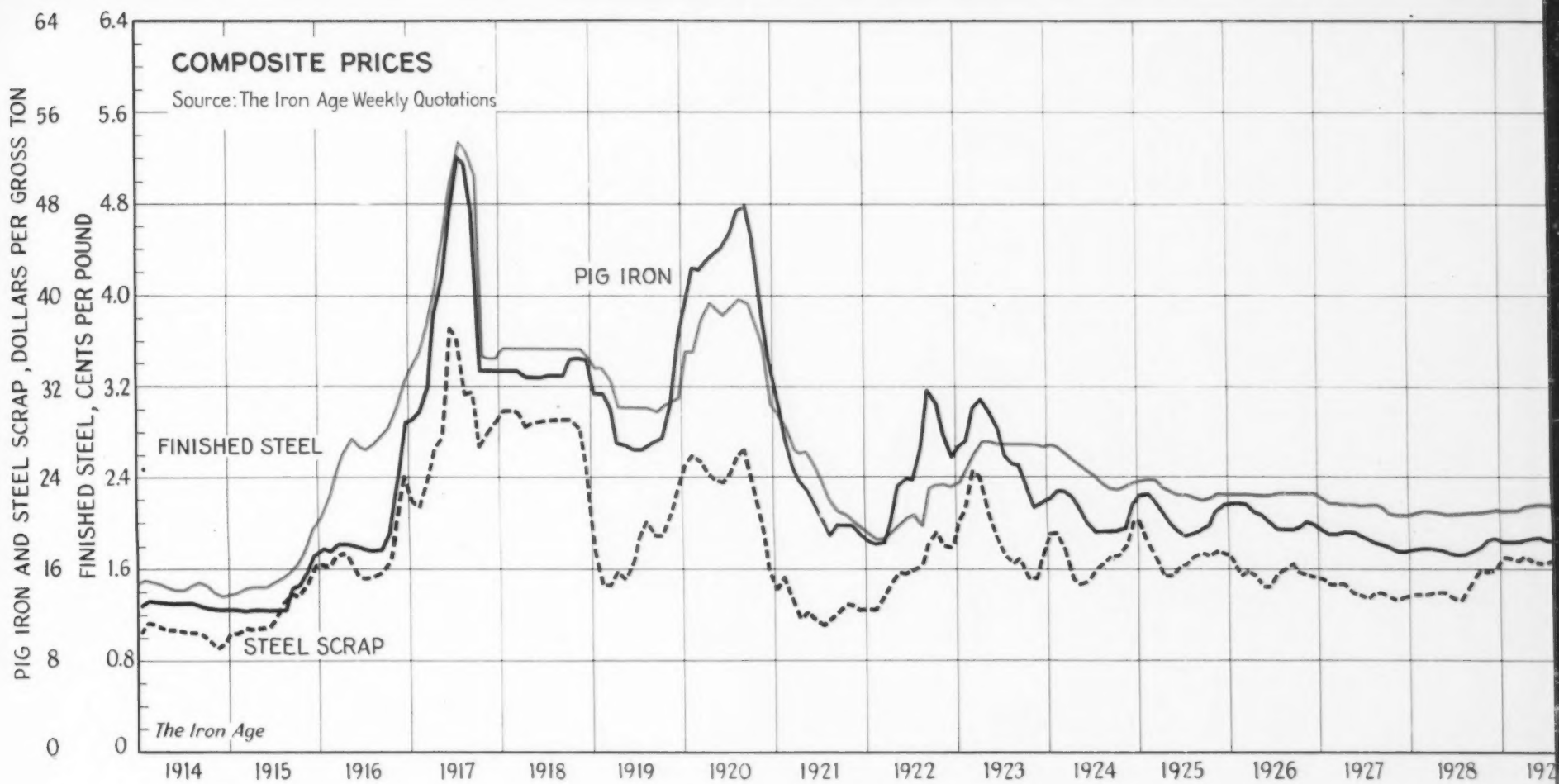
IN the fore of rising business indices in 1939, the automobile industry gives evidence that in 1940 it will rise to a level comparable with the marks set in 1937 and 1929, the "five-million-car years." Since 1940 designs in general make use of more sheet steel for each car, the consumption of steel should increase somewhat faster than the automobile production curve rises.

Except for truck sales into military use, the auto industry has made all of

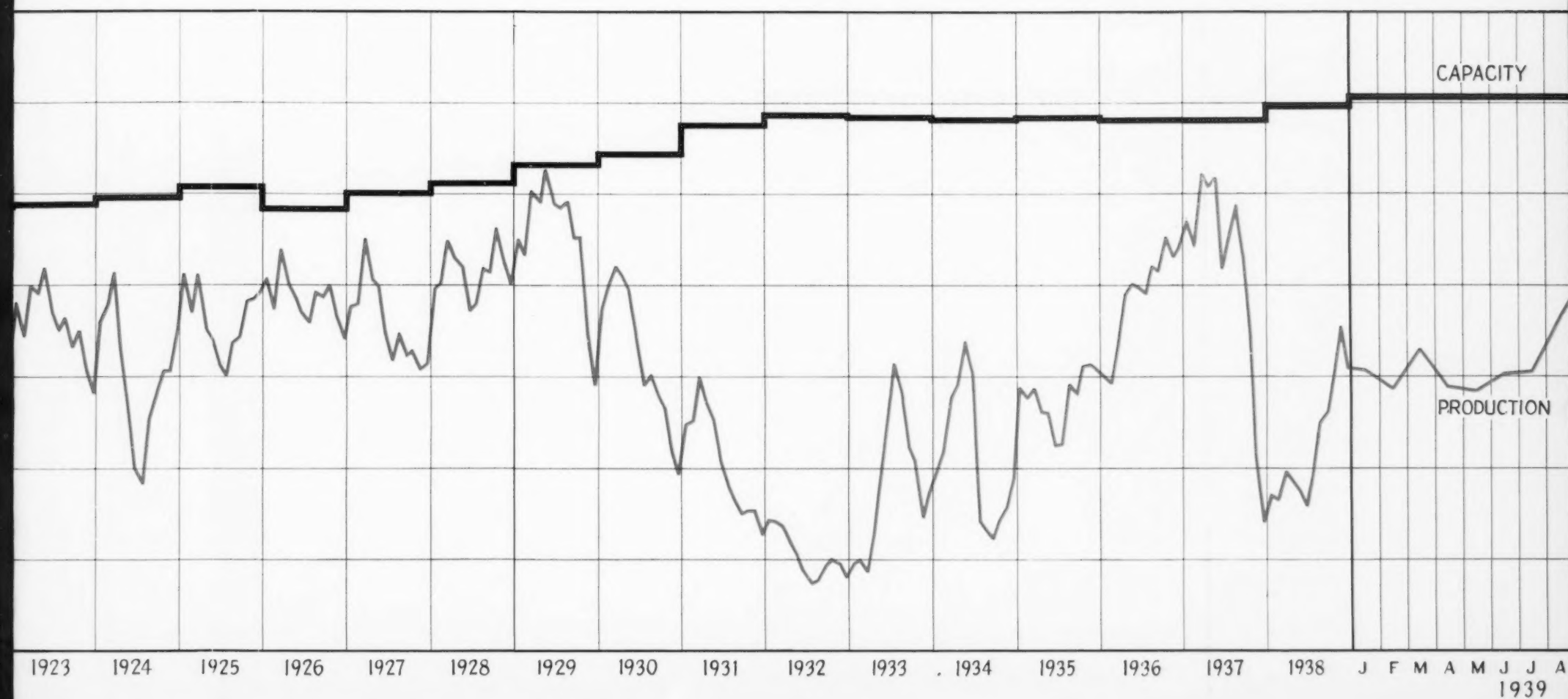
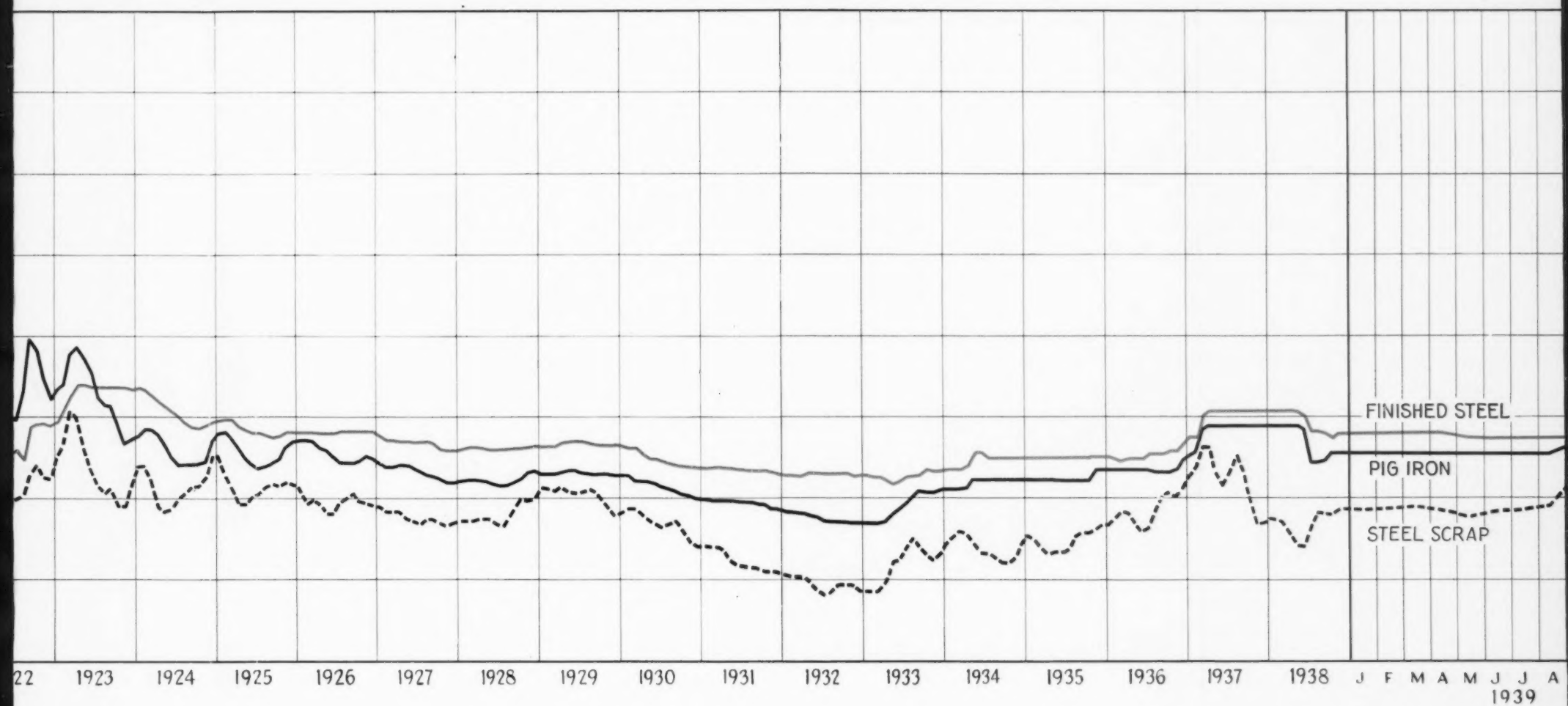
its gains on the basis of satisfying peacetime, non-military requirements.

Early season estimates of total production of 1940 model cars clung close to the 4,000,000 figure, although every manufacturer estimated individual company gains at 20 per cent or better, which would push the top estimate to nearly 4,250,000. This contrasts with a 1939 model output estimated officially by the Automobile Manufacturers As-

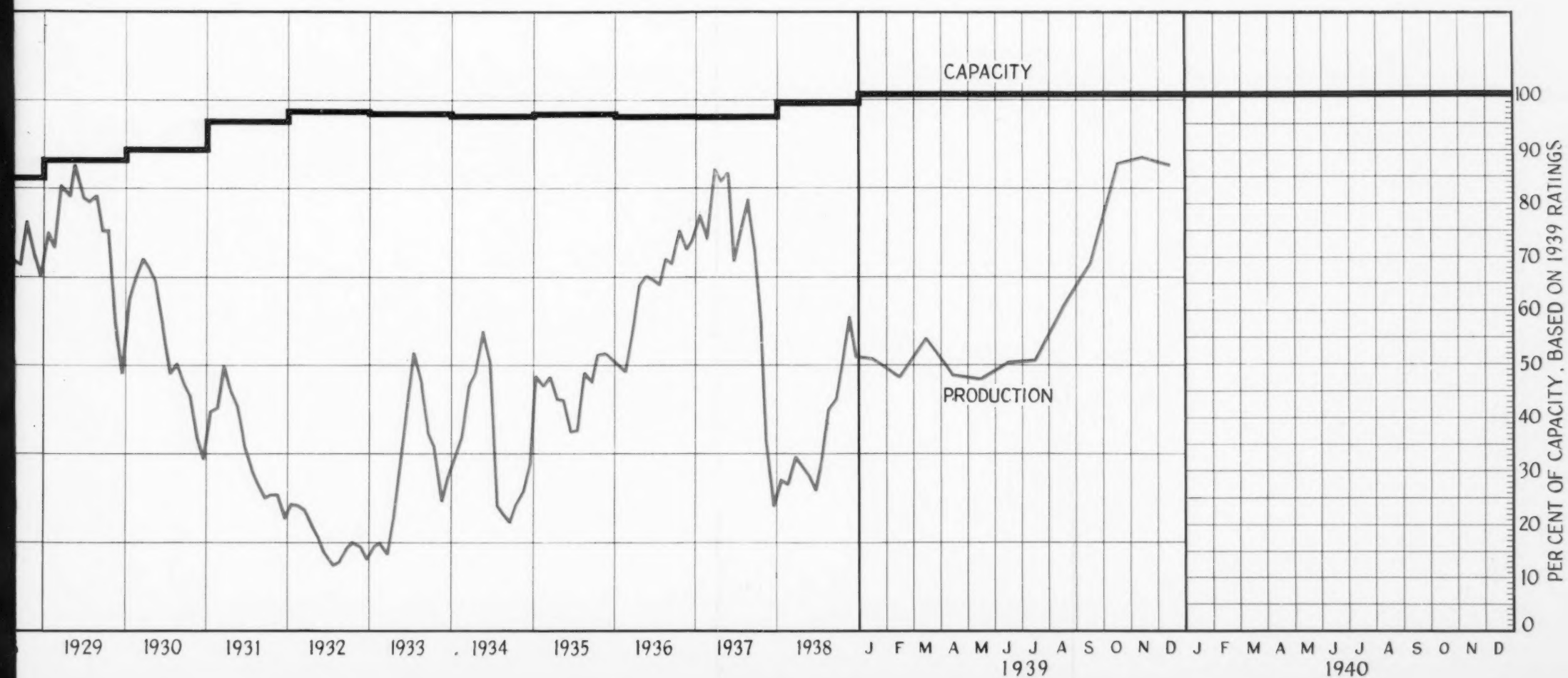
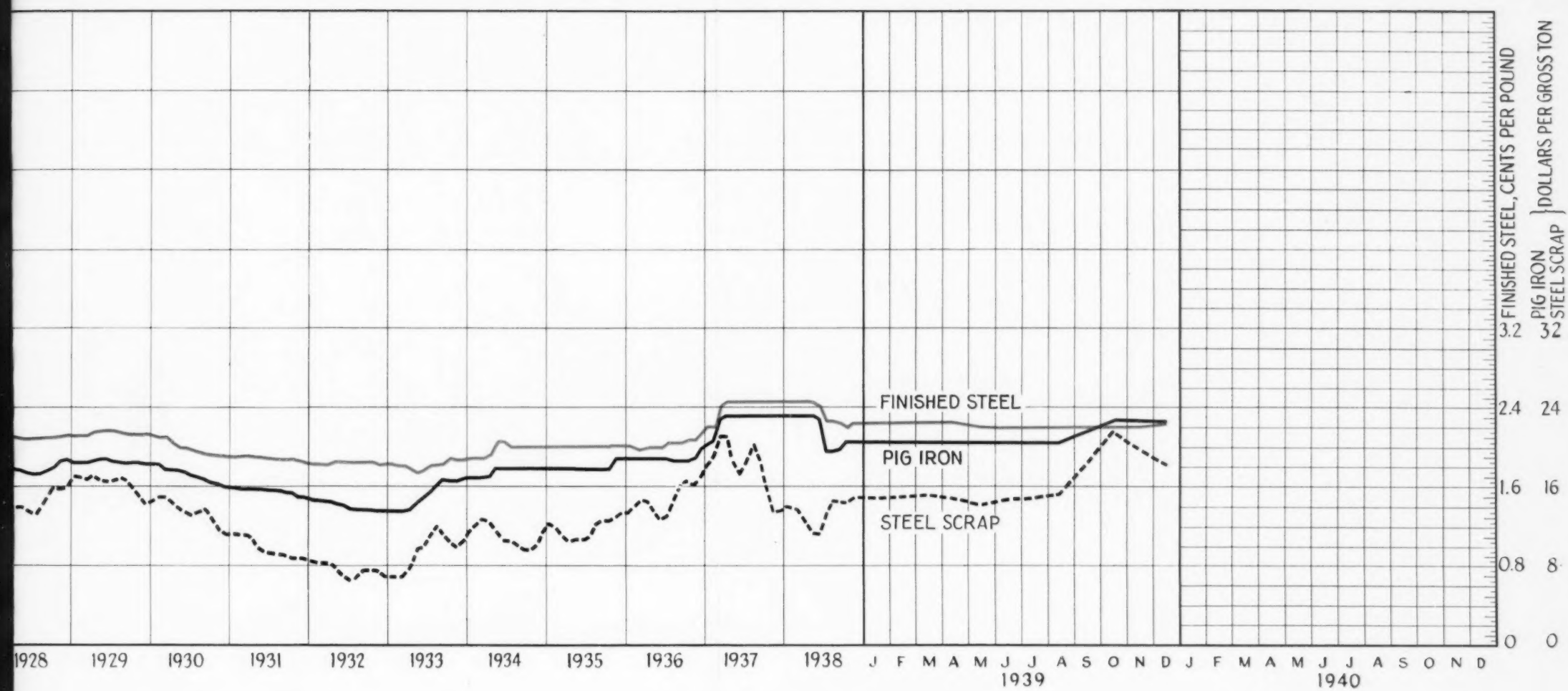
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Space has been provided in the above graphs to enable the reader to chart the trend of steel output



the reader to chart the trend of steel output and prices in 1940 as the year progresses. Data on these subjects are published



output and prices in 1940 as the year progresses. Data on these subjects are published weekly in *THE IRON AGE*.

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sociation at 3,587,000 vehicles in the United States and Canada.

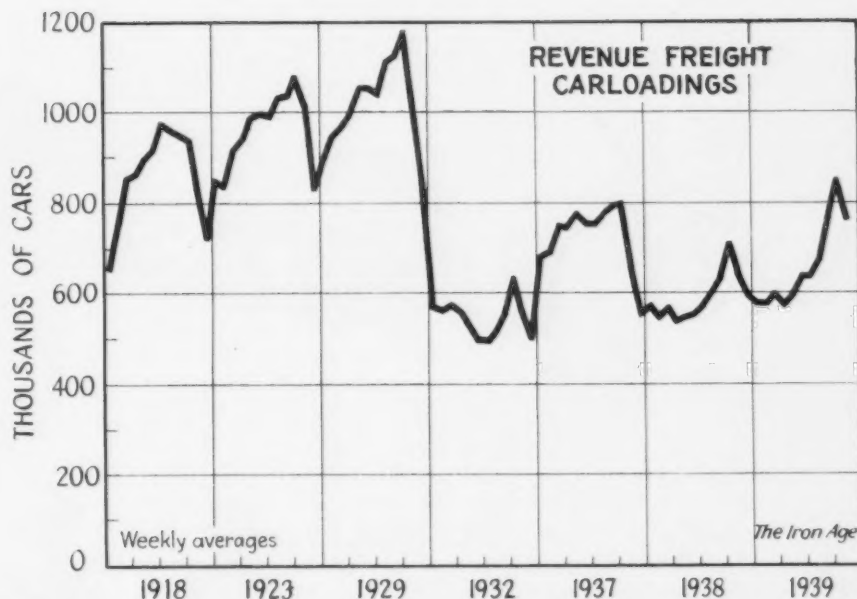
However, everything since the start of the model year has tended to strengthen estimates—and the pace now being set as the new calendar year begins is fully the equivalent of the best volume-years on record. Projected output for the first quarter is unusually high for the years since January and February ceased to be “new model announcement months,” and the million and a quarter cars which will be produced before the end of March will give the industry a rolling start on what can be an exceptional spring if sales demand remains consistent.

War Aids Truck Sales

Of the war stimulus that has been given, the United States War Department is credited with about half. This includes orders for 12,000 trucks, of almost every type, size and weight, and an assortment of trailers, all scheduled as rush jobs for Army maneuvers in the spring. Another 8000 to 10,000 trucks have been ordered by the French Government, and more Allied orders have been placed or are pending.

Lower prices were announced coincident with introduction of 1940 models; seven of the first 10 passenger car makers to show new cars lowered their figures \$10 to \$400. All manufacturers report extra equipment or accessories included on their cars. In addition, tire prices were cut as much as 12½ per cent during the fall.

The fourth quarter level of material prices was not particularly affected by international affairs because buying for most of these materials was con-



THE rapidity of the increase in carloadings in the fall of 1939 was unprecedented in railroad history, and at one point exceeded the peak of 1937, but the total for the year as a whole fell considerably below that of 1937.

Graph data source: Association of American Railroads.

summed before price changes became effective. Depletion of inventories later probably will require purchasing at higher levels. In the case of steel, 30- to 60-day inventories are believed to be general. Materials which store well probably have been ordered farther ahead, but the fact remains that materials price indices are being watched carefully. At the same time it is acknowledged that exceptionally heavy volume of car sales may avert car price increases even if materials go up.

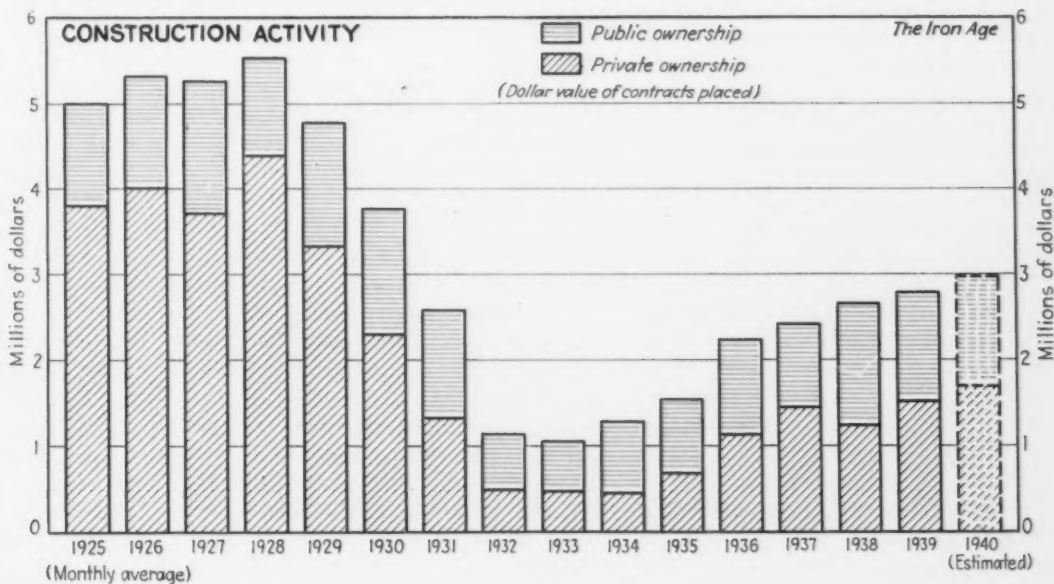
More Steel and Glass Used

More steel and more glass are required in 1940 model cars as results

of design changes introduced last September. Bodies are wider, longer, more perfectly streamlined and shielded in front, and offer better vision possibilities. Lengthening of wheelbases also continues, in most cases adding to the amount of material used. At the same time, designers are straining to reduce weight by making every pound of material do more work and serve its purpose more efficiently. One of the most successful cars of the past year was the Studebaker Champion, introduced in the spring as a “light weight” car. Other manufacturers are planning cars of this type.

(CONTINUED ON PAGE 130)

A SMALL decrease in public construction was more than offset by the gain in private building in 1939 and the year showed an increase of 5 per cent in total expenditures for new construction. Graph data source: F. W. Dodge Corp.



THE C.I.O. STILL

EARLY in 1940 large sections of American industry seem likely to face a showdown on new problems created by efforts to place collective bargaining in this country on a permanent basis.

Disputes over the right of a union, particularly the aggressive CIO, to perpetuate itself and provide permanent social security for its leaders and business agents, by forcing employers to collect union dues through the checkoff, are already coming around the corner.

Whether the unions in such large industries as those making steel and automobiles are to win the closed shop, forcing the employees of each company to join a union as a condition of employment probably will be decided in the next year.

Likewise awaiting solution is the problem only recently created and tossed into the rough and often bloody arena of collective bargaining, U. S. style, of union control of industrial production, perhaps the most important problem in the welter of collective bargaining disputes.

Socialization of Industry

These issues were put forth recently by the CIO in such situations as the Chrysler strike, and in fresh demands for concessions from employers such as Bethlehem Steel Co. and Crucible Steel Co. of America. It remained for the Chrysler strike to introduce the question of union control over production, a development into which critics of union labor were quick to read a social significance that seemed far beyond the field of pure trade unionism. Some saw the CIO-United Automobile Workers Union making a start at socializing industry.

At the most heated stage of the Chrysler-UAW dispute, which was



settled with a wage increase amounting to \$5,000,000 annually, after a \$15,000,000 loss in wages to idle employees, Herman L. Weckler, vice-president in charge of operations for Chrysler, declared that "management cannot abdicate its responsibility for any aspect of this business, whether it relates to labor, to engineering, to production or to selling. It cannot consent to sovietize its plants."

In that part of the public which has heard and believed frequently repeated stories of the speed-up of automobile assembly lines and the hardships of hard-pressed, if highly-paid, automobile workers, the CIO's efforts to control production found some support. As the possible meaning spread of what the CIO slowdowns in the Chrysler plants implied in the way of a socialized industry, the reaction, from the union's viewpoint was bad and the CIO-Chrysler agreement end-

ing the strike carried the following provisions regarding the rates of production:

"The management agrees that in establishing rates of production it will make studies on the basis of fairness and equity consistent with quality of workmanship, efficiency of operations and the reasonable working capacities of normal operators.

"If any employee or group of employees claims that the rate of production on their jobs is too fast, and the foreman is unable to adjust the matter, the job will be examined again in the following manner:

"First, there will be an examination with a union representative from the district in attendance and all of the facts shall be made available for the parties dealing with the grievance. Should a satisfactory agreement not result, the matter in dispute shall be referred to the bargaining procedure.



LABORS...

By JAMES A. ROWAN
News Editor, The Iron Age

machinery to coerce and intimidate the men into paying dues. That is what has been happening under the contract we had with the CIO union for two and one half years."

Entering the Chrysler-UAW controversy was the issue of the union organizing foremen, a point given moderate publicity in the thousands of columns of news printed about the nation's labor organizing pains.

Dealings With the Foremen

IN the steel and some other industries some top executives, while acknowledging that collective bargaining is here to stay, have held that direct negotiation between top executives and representatives of the unions, would strip foremen, minor superintendents and plant managers of authority, and create a difficult, morale-shattering situation. Partly for that reason a few high steel officials have referred CIO representatives to district plant superintendents or management's representatives with their grievances.

For reasons of prestige, the CIO generally tries to deal with as high an executive as possible on each grievance, however small, and consistently attempts to discredit steel company executives who will not meet CIO district representatives as "foes of labor." Requesting "appointments" with high steel executives for minor union leaders in order to obtain bad publicity for "labor baiting employers" recently has become part of union strategy.

In the automobile industry, the CIO has tried, by organizing these repre-

sentatives of management, to cash in on the fears and irritations of discredited foremen and minor superintendents who at times had been caught in a crossfire of collective bargaining between top management and representatives of the union.

This step, the organizing of the CIO Foremen's Union, provided ammunition for critics of the CIO who maintain that the Lewis organization is no trade union at all but a political organization, utilizing labor, which seeks to socialize industry under the leadership of sometimes imported, sometimes homegrown Communists and Communist sympathizers. One industrialist put the situation this way:

"The common sense of the situation is that a CIO foreman handling a grievance with a CIO workman or a CIO steward is in a contradictory position. Either he represents the CIO or he represents the management, and if he represents the CIO, the management loses its representative at the very point where collective bargaining begins."

When John L. Lewis and the CIO-UAW signed their first contract a stipulation was made that: "It is mutually agreed that the term 'employees' for the purpose of this agreement shall not include foremen, assistant foremen, time-keepers, plant protection employees or confidential salaried employees." Following the recent Chrysler strike, the CIO leaders at Detroit apparently gave up their efforts to seize managerial functions through organizing foremen by again signing an agreement declaring that foremen, as-

The management of each plant is authorized to settle such matters."

The agreement between the Chrysler management and the CIO ended a strike which began in a cloud of mystery. The issues were not clear and the CIO-UAW, sometimes called the radical faction of automotive trade unionism, seemed to be testing out a new strategy of which the slowdown and attempt to take control of production was part. Early in the dispute, K. T. Keller, president of Chrysler, said:

"It is perfectly clear to me that the CIO union has one paramount objective: That is to make us a party to collecting dues. As I analyze the situation, unless they get a closed shop, a union shop, a preferential shop, or some other arrangement which forces men to pay dues in order to continue to work in our plant, they will continue to use the collective bargaining

sistant foremen, plant protection employees, office employees and salaried engineers are excluded from the bargaining unit.

An opinion of the production rate controversy in the Chrysler strike was given recently in *THE IRON AGE* by Homer Martin, ousted president of the original UAW and now president of the AFL faction of the UAW. He said: "The AFL union in Detroit has a definite idea of what the objectives of a successful trade union should be and we try to limit its field to trade unionism and try to avoid taking over any of the duties and responsibilities of management. We are not equipped

of the attempted seizure of managerial responsibility has not yet become an issue, partly because of the more conservative policy of Mr. Murray's union.

Checkoff Dispute Growing

However, the dispute over the checkoff of union dues, by which the company paymaster each month slips his hand into each pay envelope to extract \$1 for the SWOC treasurer before the envelope goes to the employee, is fast becoming a matter of concern. At times CIO leaders have hedged in commenting on the touchy subject of the checkoff, which the general public may decide is undemocratic, although

visions of a new contract. The ballot reads:

UNION RECOGNITION

"Whereas a majority of the workers belong to the union, membership in the union shall be a condition of employment for all workers. The union shall be the sole collective bargaining agency for all workers."

Elsewhere on the Crucible ballot, which for the first time brings into the open the CIO drive for the union shop and checkoff of union dues against large steel companies, is a request emphasizing the union's greater appeal to younger, unmarried, perhaps more radical workers in steel plants, that straight seniority be provided in the new contract, the length of continuous service being the only factor. The present Crucible contract, and the standard agreement held with those other large steel companies that have contracts, provide that "family status," that is, the number of dependents, will be considered a factor in seniority along with skill, efficiency and physical fitness.

Leaves Union Free

Nothing is so comforting to trade union leaders as the closed shop and the checkoff of dues, concessions which have already been granted by some small steel fabricating companies. Such provisions appear in the SWOC contract with the Pittsburgh Tube Co., effective Dec. 1. "This contract," a SWOC official said, "leaves the steel union free to devote its full energy and attention to the improvement of relations in the plant. The contract is a demonstration of the company's complete acceptance of collective bargaining. I am sure that under it can be demonstrated the real value of a disciplined, well-organized labor union, thus providing for better efficiency and elimination of waste frequently caused by dissatisfied employees."

Anything less than acceptance of the dues checkoff and the closed shop is, to the SWOC and to the unions generally, not a "complete acceptance of collective bargaining," a point which will get more attention as 1940 moves on and if business continues at a satisfactory level.

What the CIO Has Done

TO critics of the union movement, Mr. Murray, the SWOC chairman, says:

"I want you to think now in terms of the conditions which prevail today as against the conditions which prevailed in this (the steel) industry be-

Detach and Deposit in Lodge Ballot Box

BALLOT

Having studied carefully the results, to date, of negotiations between the SWOC and the Crucible Steel Company of America to negotiate a new collective bargaining contract, please indicate below your position and attitude on our future course of action:

I HEREBY GRANT THE INTERNATIONAL OFFICERS OF THE SWOC THE POWER TO TAKE WHATEVER ACTION REQUIRED, INVOLVING A STRIKE IF NECESSARY, TO SECURE A CONTRACT THAT WILL BE SATISFACTORY TO ALL CONCERNED.

YES ☐

NO ☐

REPRODUCED above is a SWOC strike ballot which calls for union members in plants of the Crucible Steel Co. of America to grant the SWOC the right to order a strike. In this instance, the SWOC for the first time is demanding from a large steel company that union membership be a condition of employment and that the company collect union dues through the checkoff system.

to assume the responsibilities of management in the automotive industry and, among other things, we don't try to organize the foremen.

"Likewise," said Mr. Martin, "we know that trying to take control of production, as did the CIO in the recently lost Chrysler strike, will in the end weaken or kill any union. An intelligently-run union would shrink from attempting to seize control of production in an automobile plant, a steel plant, or any kind of plant or factory unless it had a parallel aim of socializing industry. We are not interested in socializing industry."

So far, the steel industry has met little pressure from the CIO's Steel Workers Organizing Committee, headed by Philip Murray, for a voice in production rates. Making steel is not an assembly-line industry in the Detroit sense. In some mills the SWOC has sought to enroll foremen who often find themselves a somewhat unhappy class of men but the movement has not been widespread and the question

the SWOC has just made a checkoff demand on one of the large steel companies, the Crucible Steel Co. of America.

With the dues demand the SWOC tossed to the Crucible company a demand for the union shop, which is a closed shop except that a worker need not be a union member when employed but must join and pay his dues within a stipulated period.

SWOC comment on the Crucible Steel company labor situation has avoided mention of the closed shop, although it listed the collection of dues by the company as one of its demands. Thus the closed shop, apparently, is still a delicate subject in view of the more than academic interest which the general public is taking in democracy and its manifestations.

However, on the CIO-SWOC strike ballot handed each Crucible Steel employee in the first week of December, the closed or union shop demand appeared as big as life, the first on the list in the Union's proposals of pro-

fore the Congress of Industrial Organization was brought into being. The working men and women employed in that industry for over a period of approximately 50 years lived under a condition of abject servitude. Their political lives and destinies were completely guided, dominated and influenced by the managers of that industry.

"The majority of the steel industry—and I speak now from the point of view of management," Mr. Murray added, "knows the SWOC adheres to these principles (American) for their experience with us for nearly three years has changed from the skeptical 'you must show me' attitude to one of praise."

Emphasis on NLRB

Meanwhile, managers of the steel industry, speaking for themselves, frequently list the National Labor Relations Board as the Industry's No. 1 enemy. The head of one large company, which does not have a signed contract with the SWOC, told THE IRON AGE that he could get along with the union but that he could not get along with the Labor Board. Its great power, he said, is more dangerous to the country than any other New Deal agency. Situations have arisen in which the steel companies and the steel union might have reached a settlement of the issues except for interference of the NLRB. "I know of cases," he said, "where the Labor Board has forced concessions for which the SWOC has not asked but which, somewhat surprised, it thankfully accepted."

Highly important to both industrial employers and employees during 1940 will be the general public's reaction to the dues checkoff and the closed shop, once these issues are widely understood, and to any further attempts by organized labor to seize control of production rates. An inevitable question will be: "Are these things to be part of the American, democratic way of collective bargaining?" How John L. Lewis and his fellow leaders in the organizations of mass production employees answer this question may determine whether or not the CIO is painfully to remain "in labor" for another year, whether it is to die trying to give birth to a wrong way system of collective bargaining, or whether it is to emerge as the trade union upon which industrial collective bargaining of the future will be based. As much to its friends as to its foes, the CIO seems to be facing another year "still in somewhat painful labor."





INVENTORIES

Iron Age Survey In Brief

Question: How many days' steel supplies are in the hands of consumers in relation to operating rates?

Answer: Weighted average of 15 groups of large and small steel consumers shows steel inventory in late November, 1939, actually a few days lower than in November, 1938, and 22 days below November, 1937.

Question: What is operating rate in these 15 steel consuming industries today?

Answer: Weighted average shows 35 per cent gain in operations in late November, 1939, against November, 1938, and 3 per cent gain against November, 1937. Operations of these 15 groups in first quarter expected to hold at December rate, tabulation of replies shows.

Question: In view of steel orders placed and inventories, will the latter be topheavy in first quarter with respect to operating rate expected then?

Answer: Majority says NO.

For Details on Groups and Trends See Table and Charts

IN relation to plant operations, inventories of steel held by 15 industries in recent weeks were under the level of one year ago and well below two years ago, THE IRON AGE finds after a nationwide survey of representative large and small companies, on the basis of their actual days' steel, including both work in process and piled.

Inventories of steel in early 1940 probably will not be excessive when related to the expected production schedules of finished products, in the opinion of 87 per cent of the firms participating in the survey. This forward glance was asked after the firms had been given the opportunity to take full consideration of their position in the 1000 questionnaires sent out. The

question was inserted to help offset the fact that steel mills were shipping heavily at the time of the survey, in late November and early December.

Other salient points uncovered by the study are as follows:

(1) Weighted averages of the 15 groups combined show that no change is expected between estimated December operations of 84 per cent and estimated first quarter operations. Considered individually, 9 of the 15 groups look for slight recessions in the first quarter, compared to December, but none expect greater than 10 points decline; four groups are counting upon better activity in first quarter, averaging around 5 per cent; two groups expect no change.

(2) In late November, 1939, according to the grand total weighted average of 15 groups of large and small steel consumers, there were 74 days' steel (work in process and piled) on hand in relation to operations, against 77 days in November, 1938, a 4 per cent decline, and against 96 days in November, 1937, a decline of 23 per cent.

(3) At the same time, grand total weighted average operations rose to 81 per cent in November, 1939, a gain of 35 per cent over the rate of 60 in November, 1938, and a gain of 3 per cent over the rate of 79 in November, 1937.

(4) Although inventories, specifically related to operations for the groups surveyed, were down 4 per cent in November, 1939, from November, 1938, physical volume of grand total inventories in these two periods actu-

Normal or Excessive?

By DON R. JAMES

Cleveland Editor, *The Iron Age*

ally showed an increase of 27 per cent. Compared to November, 1937, physical volume of inventories was down 21 per cent from November, 1939, while the relative decrease, obtained by taking into consideration the operating rates in both periods, amounted to 23 per cent. These figures are based on the obvious fact that even though the days' supply of steel might be the same for two separate periods when computed in relation to operating rates, an actual difference almost always exists in the physical volume of steel

on hand when a difference is present between the operating rates in the periods under survey.

(5) Many firms whose pre-war steel buying policy ranged from hand-to-mouth up to 60 days, have adopted a three-month supply basis. Fifty-four per cent of the total firms reporting were on this basis in late November, against 26 per cent in November, 1938, and 27 per cent in November, 1937. Extended mill deliveries have been the principal cause of the change.

(6) While finished product inven-

tories in the hands of manufacturers were not the primary purpose of the survey, returns to one question devoted to this subject were sufficient to show that in late November, 1939, finished product inventories were below those held by the same companies in November, 1937. Fifty per cent of the firms answering the question reported their finished product inventory ahead of November, 1938, 9 per cent were unchanged and 41 per cent had less than in 1938.

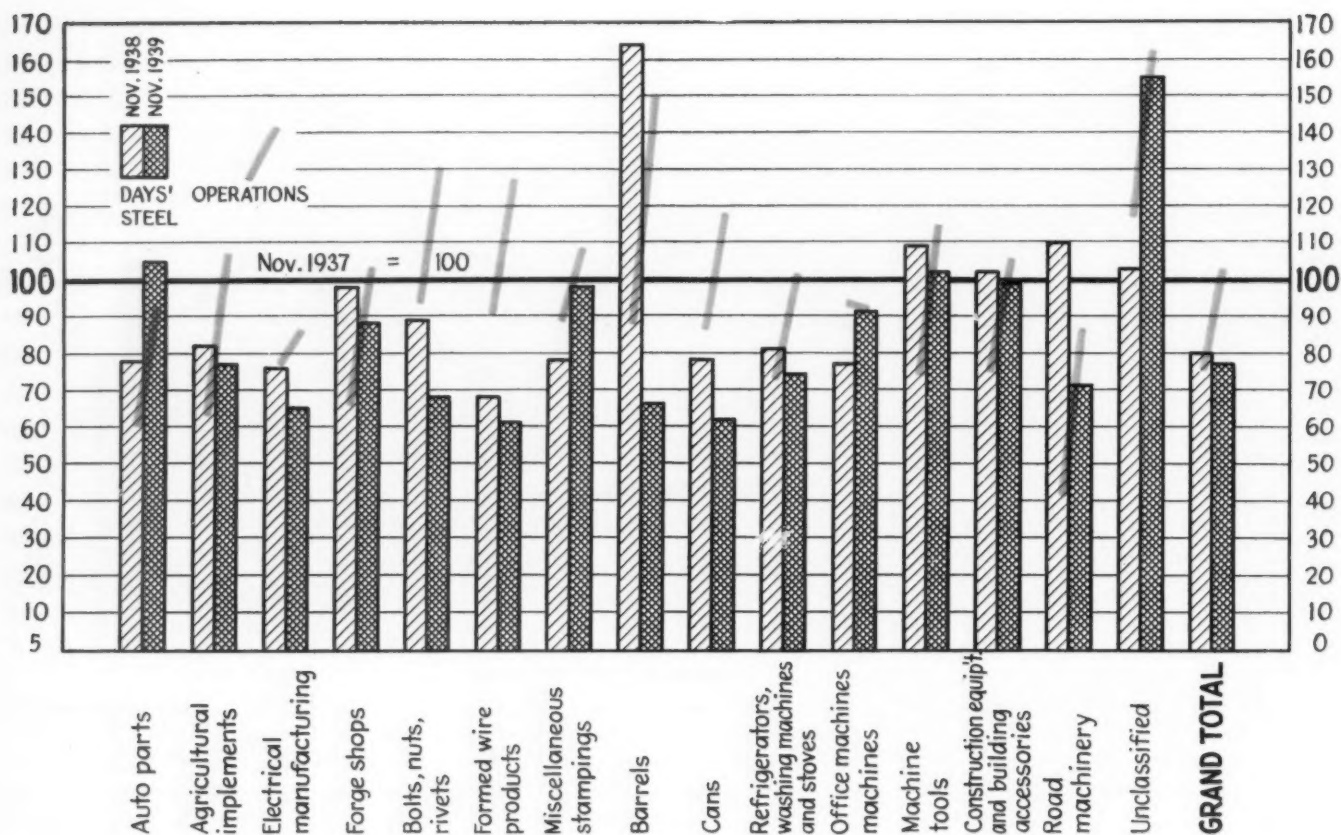
(7) Aggregate employment of the

ANALYSIS OF STEEL INVENTORIES, OPERATIONS, EMPLOYMENT, AND OPINIONS OF COMPANIES SURVEYED, IN 15 GROUPS

GROUP	DAYS' SUPPLY OF STEEL (Weighted) In Process and Piled Reported in Relation to Operations					Will Inventory Be Too Heavy? (Per Cent)		PLANT OPERATING RATES In Per Cent of Capacity (Weighted)						EMPLOYEES (Reporting Firms Only)				Days' Steel Index 1937 = 100 Per Cent		Plant Operations Index 1937 = 100 Per Cent	
	Per Cent Change, 1939 From							Per Cent Change, 1939 From						Rates Expected by Reporting Firms							
	Nov. 1939	Nov. 1938	Nov. 1937	1938	1937	No	Yes	Nov. 1939	Nov. 1938	Nov. 1937	1938	1937	Dec. 1939	First Quar. 1940	Nov. 1939	Nov. 1938	Nov. 1937	Nov. 1939	Nov. 1938	Nov. 1939	Nov. 1938
Agricultural implements	109	115	141	-5	-23	78	22	86	50	80	+72	+8	86	86	29,185	23,667	34,462	77	82	108	63
Auto parts	57	42	54	+36	+5	76	24	78	50	84	+56	-7	83	81	14,315	10,064	15,598	105	78	93	60
Barrels	41	102	62	-60	-34	86	14	97	56	64	+73	+51	95	89	472	426	454	66	164	151	88
Bolts and nuts	102	133	150	-23	-32	100	0	89	64	68	+39	+31	88	86	668	514	618	68	89	131	94
Construction equipment and building accessories	87	90	88	-3	-1	82	18	84	59	79	+43	+6	78	68	8,190	7,086	9,122	99	102	106	75
Cans	75	94	121	-20	-38	75	25	64	47	54	+36	+19	46	45	4,877	4,338	5,080	62	78	119	87
Electrical manufacturers	65	76	100	-15	-35	80	20	75	65	85	+15	-13	80	85	68,174	57,886	77,128	65	76	87	77
Forge shops	50	56	57	-11	-12	92	8	74	47	71	+58	+4	77	77	3,050	2,374	3,244	88	98	104	66
Formed wire products	69	77	113	-10	-39	100	0	88	63	69	+40	+28	85	77	2,429	1,949	1,992	61	68	128	91
Machine tools*	96	102	94	-6	+2	94	6	100	64	87	+56	+15	103	105	8,821	6,381	8,356	102	109	115	74
Office machinery	84	71	92	+18	-9	86	14	78	80	85	-2	-8	92	87	8,416	8,725	9,442	91	77	92	94
Miscellaneous stampers	39	31	40	+26	-2	88	12	82	67	75	+22	+9	86	85	972	776	1,102	98	78	109	89
Refrigerators, washing machines and stoves	50	55	68	-9	-26	85	15	86	61	84	+41	+2	89	93	6,766	5,386	6,941	74	81	102	73
Road building machinery	67	103	94	-35	-29	100	0	60	29	69	+103	-13	62	68	1,950	1,380	2,255	71	110	87	42
Unclassified	56	37	36	+51	+55	90	10	95	68	58	+40	+63	95	91	17,068	16,695	18,051	155	103	163	117
GRAND TOTAL	74	77	96	-4	-23	87	13	81	60	79	+35	+3	84	84	175,353	147,647	193,845	77	80	103	76

* Machine tool operations estimated, using November, 1939, as 100 per cent.

NOTE—All days' steel supply and capacity figures have been weighted in relation to the size of the reporting firms and the grand total for days' steel supply and operating rates has been weighted relative to the size of each group.

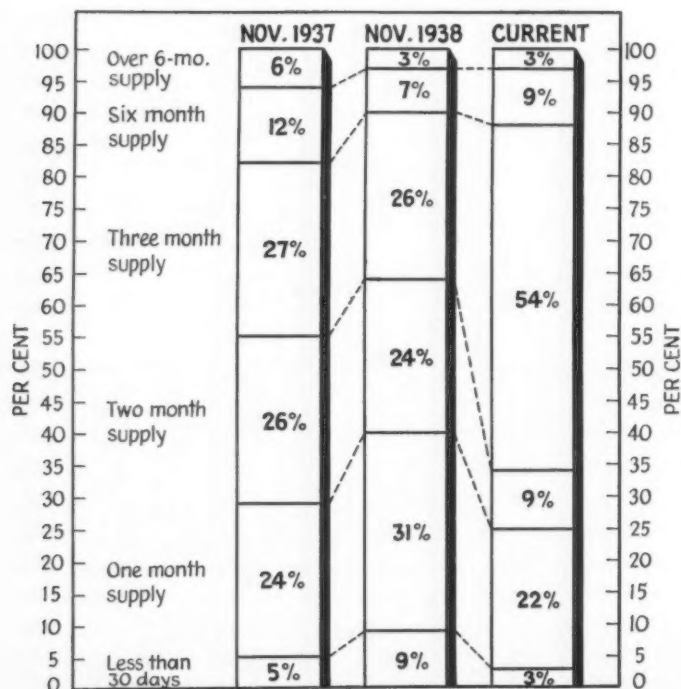


STEEL inventories in days' supply, for both work in process and piled, for 15 consuming industries. Also shown are the plant operations. Data are for November, 1938, and November, 1939, in per cent of November, 1937. Days' supply and operations weighted for relative size of company. 1937 = 100 per cent.

15 groups is well ahead of 1938, but not yet back to the level of late 1937, although it is assumed that employees on the payrolls in November, 1939, were getting more time and wages than in 1937.

(8) Very little difference was found between large and small firms from the standpoint of days' steel on hand in the months surveyed and in the matter of buying policy. Classified by this standard, current buying policy is as follows:

Companies 0 to 250 Employees	Companies 251 to 2000 Employees	Companies 2001 and over Employees
83 days	87 days	81 days



ACTUAL steel inventory practices in November, 1937, and November, 1938, compared with current inventory policy. In per cent of total firms reporting.

Months before the outbreak of the war in Europe, inventory build up generally was considered necessary and justified. Many plants had depleted their stocks too far and were running too close to their actual sales, the long process of depletion having begun in the fall of 1937 when stocks suddenly became abnormal owing to the unprecedented fall in general business conditions. The outbreak of hostilities in Europe set off the buying wave, upsetting normal industrial and business relationships in a very short time.

The fact that 14 of the 15 groups

studied show good-sized production increases in November, 1939, over November, 1938, while 10 of the 15 were ahead of their 1937 operating rates, indicates that very little steel was being stored at the time of the survey. Many consumers expect and will get better deliveries in January and February on steel commitments already placed. A fair portion, especially those using flat rolled steel, received heavy shipments before Dec. 31. Days' steel on hand in late January and February will be above the amount shown by the present study and needs will be well covered, largely due to the delayed mill delivery situation, plus the fact that the price trend cannot be downward.

In addition to the war, which induced inventory build-up, there were several differences in conditions in the fall of 1939 as contrasted with the immediately preceding years. In the fall of 1938, flat rolled steel prices cracked, which led to generous buying, particularly by the automotive industry. Contrasted with the practice in the fall of 1936 and in early 1937, steel producers in late 1939 attempted to hold down purely speculative buying and duplication orders. No major price advances occurred, such as featured the 1936 and 1937 stampede. These factors seem to point to an orderly readjustment of steel inventories if warranted by subsequent business conditions.

One of the biggest points in the picture, which unfortunately cannot be answered finally at this juncture, is how soon public purchasing power will digest the finished products now present in most channels of distribution. This affects every one of the 15 groups surveyed, although some to a lesser extent than others.

The movement into ultimate consumption was increasing gradually prior to the outbreak of the war, but did not rise as fast as production after Labor Day. All signs point to a better year in 1940, even if the first quarter should fall below the past quarter.

In some of the household equipment lines, stocks of discontinued models are low, indicating that carry-over into 1940 will not be excessive.

Order backlogs of the machine tool and electrical equipment groups are particularly large. Manufacturers of agricultural implements expect an active sales year. Steel on hand for this industry in first quarter will be greater than the amount indicated by the sur-

vey. A share of the industry has reverted to the former policy of having steel for spring manufacturing come in at the start of the year. The can companies which participated in the survey group are representative of some of the smaller firms as shown by the number of employees and in late 1939 activity was well maintained, with general line cans being shipped out at a fast rate.

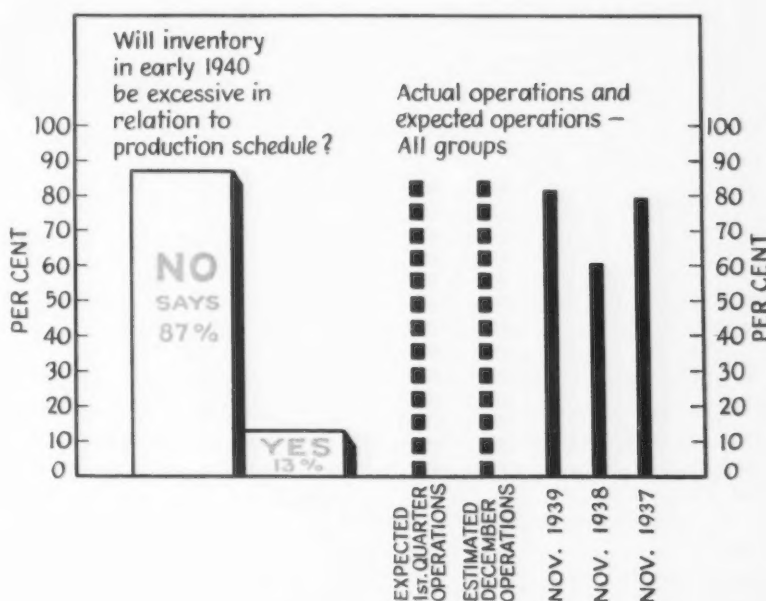
Effects of the Chrysler strike were noticeable in some of the returns from the automotive parts group, but one year earlier this group had bought heavily when flat rolled steel prices broke.

Barrel makers and stampers, with

supply houses, with one or two exceptions, are operated by steel companies. One of these exceptions is included in the "unclassified" group.

Whereas the automobile manufacturing industry years ago stored steel quite extensively, the trend in recent years has been toward using steel mills as an inventory base and releasing for comparatively short manufacturing cycles. In view of this it was decided to eliminate the automobile manufacturing classification. Parts makers, however, are included.

After all this weeding out, the result is believed to be a fair cross-section of large and small companies which over the years are in the market



41 and 39 days of steel respectively, had the lowest days' steel on hand of any of the 15 groups, at the time of the survey. However, barrel makers were operating at 97 per cent, second only to the machine tool industry.

Replies to the 1000 questionnaires were numerically excellent, despite the details asked. But due to the comparisons desired in the final result, returns were unusable if incomplete or if the information was not in the form desired. Steel producers and any of their subsidiary fabricating plants were eliminated, lest the picture be distorted. Shipbuilders and railroad equipment manufacturers were eliminated because they customarily buy for specific projects. While they have large backlogs now, their business is not standard nor seasonal and fair comparisons with previous years are difficult. The oil country classification was omitted, because principal oil country

fairly steadily in line with their operations.

The survey was conducted in late November and early December with the recognition that steel inventories this year were still on the increase, but it was felt late December and early January would not be the best time to judge inventories, due to the influence of the holidays, the inventory tax situation in some states and other obvious reasons.

Dollar figures were not sought, as they are subject to price fluctuations from year to year, while accounting practice provides for a choice between either purchase price or market value including labor. Varying dates of purchase and production, prices and costs also make dollar figures less reliable.

Limiting the survey to steel alone helped preclude the possibility of error on the part of reporting firms and contributed to the clarity of the study.



FOR decades an individual of the genus steelman would likely have been psychologically typed as a cycloid personality—he experienced rhythmic periods of exaltation and depression. If the business world should be overcast, the steel seller couldn't conceive of a rainbow behind the clouds; and, should production indices reach for the peaks, then a neat bit of rationalization was trotted out to paint a primrose path far into the future.

But, today, there is distortion in this familiar chill and fever pattern. The febrile steelman is racked with uncertainty. He may be sotted with the press of orders, but his viscera are still knotted by the proximity and severity of the 1937 business debacle; exhilarating as the European war is, there persists a pink elephant background of a previous war hangover; there have been confusing shifts in production technology; and the stock market ain't actin' right. Thus, even though the steelman has a grin clear across his pan, behind the grin is an annoying muddle of inimical impressions, namely—

(1) With proper encouragement there will be a release of large accumulated demands for steel, demands capable of straining the streamlined capacity constructed over the past decade. But, still, there is a gnawing doubt.

(2) The recent dramatic upturn in

steel production is a natural rather than spurious recovery. But, still, there is a gnawing doubt.

(3) Inventories in secondary hands are not accumulating, as demonstrated by generalized observations and specific surveys. But, still, there is a gnawing doubt.

(4) War business is a curse, and peace tomorrow would constitute a boon without quibble. But, still, there is a gnawing doubt.

Quite obvious, four such sets of persuasions, tintured as they are with doubt, are not conducive to equanimity. A little analyzing of each, however, might well serve to precipitate out a few guide posts for the future; a few guide posts which may indicate whether Pittsburgh, Gary and Birmingham may continue blanketed with smoke or will again soon swelter under the fleckless, sunny days that were so drearily monotonous in the troughs of the several depressions.

Sentiment Over-Corrected

Probably the most astounding of the year's end phenomenon was what may be termed "capacity operation gloom." Earlier, there had been a period of viewing the industrial picture through magnifying glasses. Steel operations were climbing at an unprecedented pace, war in Europe promised war orders, and a sellers' market reigned supreme. An over-awareness of pos-

sible repercussions ensued, an over-disappointment in the lack of foreign demands developed. The magnifying glasses were over-corrected, and the industry in looking through the new lenses saw (sub-consciously perhaps) trying times to come. The pendulum swung too far both ways—an in-between position is favored.

Statistically, the 90-95 per cent of capacity operations of late November and early December were a transient abnormality. Such operations are neither economically healthy nor commercially desirable. Certainly, the bulk of the steel industry has recognized the dangers inherent in demands pressing more-than-ample capacity, as witness the general reaffirmation of prices for first quarter to settle speculative fevers, and the under-cover pressure put on regular customers to keep forward orders to within some sensible relationship to past consuming performance.

Just what relation does 90-95 per cent operations have to the normal expectation of the steel industry? Just about what should be in store for the industry over the next few years? Some approximation of the answers is best arrived at through an examination of past history.

If production for each month is graphed for the past 20 years, from 1920 to 1939 inclusive, the performance of the steel industry is recorded

Once scorched, now twice chary—but twice won't be half enough if and when domestic demand falters and exporters croon chivalric torch songs and break into a cancan with bloated and luscious orders

as in Fig. 1. Included in the performance are several boom periods and several depressions, and the 20 years constitute as representative a cross-section of recent steel activity as is available.

By analyzing the production data for the 20 years (by least squares) a trend line is obtained, as indicated. (The possibility of a sinusoidal trend is discarded, arbitrarily.) This trend line has several interesting characteristics, the most obvious of course being its position in late 1939 far below the 90-95 per cent operations ruling at that time. Of course, classically interpreted, the position of steel making activity far above the line in late 1939 would indicate a compensating position below the line at some future date, the pace of the reversal being ruled by such current market factors as reliability of the recent domestic recovery, the length and ramifications of the war, and commercial and technical patterns established by the steel industry itself.

Another interesting characteristic of the trend line in Fig. 1 is its slope—actually a decrease in steel production each year of 11,000 tons, based on the record of the past 20 years. Again, this is a classical interpretation. The author prefers to consider the trend as qualitative rather than quantitative, and finds it more satisfying to inter-

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By T. W. LIPPERT

Metallurgical Editor, *The Iron Age*

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lard the interpretation with a certain number of asides.

The trend line could be backed up with some consideration of the normal growth expectancy of steel consumption in this country. At best the results are far from exciting. There has been all too often a certain degree of popular entrancement with a neat linear relationship extrapolated into the future based on an expanding home population; equally satisfying to many is the pastime of putting a planimeter on negative areas for the depression years below some type of trend line, calling it delayed or unsatisfied demand, and arbitrarily setting it on top of the line at some complexly calculated future date; streamlined production, with its dramatic continuous mills and impressive technological advances, also calls up prophecies of impressive future expansion.

To the author, however, a variety of evidence would indicate that the *over-all curve of steel production at worst is negative and at best is flattening out rapidly*. Naturally, there will be year-to-year jiggles and joggles in

the curve, but the average slope will likely be quite small. This country has passed through its adolescence—and adolescence is the period of change, growth, expanding consumption and wastage. As a result of improving metallurgy the life expectancy of today's steels is 50 per cent above that of a decade ago. Furthermore, America is fast shifting into a phase having no historical counterpart—a phase wherein the average age of the population is moving upward fast—a phase in which a large part of earned income, as individuals and as a nation, is going to be spent in the support of old folks rather than the raising, training, entertainment and pampering of young folks. Such a phase augurs ill for a rapidly expanding per capita consumption of steel.

Transportation Tonnage Stable

Indicative of this flattening of the curve are some interesting figures on the steel passing into two major outlets over the past several decades. Insofar as the author knows, these particular data have not received the attention they deserve.

The automobile, the so-called backbone and arbiter of steel activity, is erroneously judged by many as being an expanding consumer of steel. However, almost two decades of the automobile has merely resulted in a transference of steel tonnage. Over the past

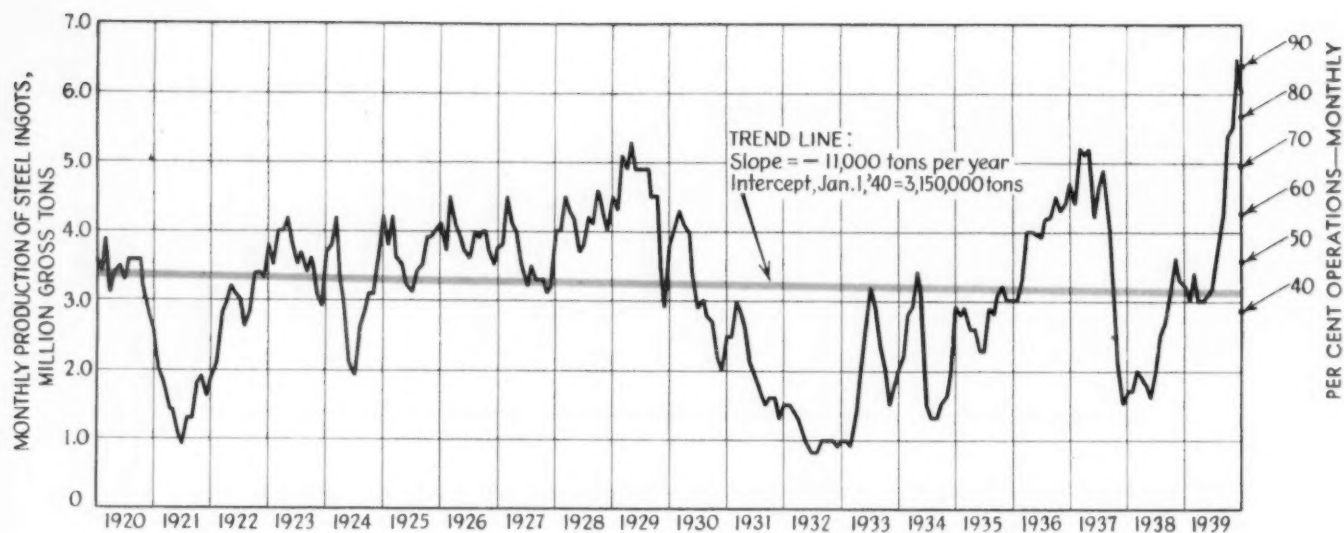


FIG. 1

19 years, the amount of steel going into transportation has actually dropped, but the type of steel has almost completely changed. To amplify, 15 to 20 years ago large quantities of light plates went into tank cars (railroad) for the transportation of oil and gas. A considerable volume of this demand subsequently disappeared, only to pop up in the production of line pipe. (The nation's pipe lines now carry 55-60 billion ton-miles of oil and gasoline annually.) Furthermore, railroad purchases of forgings, plates, shapes and miscellaneous steel in the '20's underwent considerable downward revision, but at the same time a compensating tonnage appeared in automobile sheets, strip, bars, etc. Getting more specific, consider the curve dealing with this situation in Fig. 2. Taking the three major variables in internal transportation—the railroads,

TWO decades of steel production show (unfortunately) a negative trend line. Perhaps the following years may change the sign of the line, but little is in prospect to warrant expectation of anything more than a small positive slope.

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the pipe lines, and the automobile—the trend line since 1920 for steel consumption in transportation is actually negative.¹

This trend line exemplifies the care necessary in interpretation—for its projection in the far future, say 30 years, would indicate zero consumption of steel for transportation. However, the data used, particularly in the early '20's are not likely to be completely accurate. At worst the line is interesting, and at best the trend could be considered as

showing that home transportation can be depended upon to account for little more steel than it did several decades ago.

And, then consider tin plate, the old dependable of the steel industry, and for many years probably its most profitable line. In 1929 tin plate was conventional tin plate, just as it always had been for decades, and the cold reduced tin plate of Wheeling Steel Corp. was practically a universally maligned pipe dream. But, the power wielded by consumer preference was potent, indeed, and the next few years witnessed a hysterical scrapping of hot reducing (and long amortized) mills and installation of costly cold reducing capacity.

All this hell and fireworks over millions being spent in new cold reducing capacity has in general obscured the unfortunate fact that the past 15 years has given tin plate production a rise of a scant 1 per cent yearly, irrespective of the adoption of canned beer and canned oil. In 1939 tin plate production (a good year) was about the equal of 1926 production, the major difference being that in 1939 probably 78 per cent of the out-

¹ Distribution of steel directed toward automobile and railroad outlets based on yearly surveys made by THE IRON AGE. Pipe line tonnages 1933-38 from American Iron and Steel Institute; for 1920-32 estimated from pipe line mileage reported by Interstate Commerce Commission. All data subject to some (indeterminate) errors. Breakdown of graphed data follows:

Year	Automobile	Railroad	Pipe Lines	Total, Gross Tons × 10 ⁶
1920	3,234,786	7,440,001	208,883	10.9
1921	1,477,401	3,398,021	323,795	5.2
1922	2,645,200	5,819,440	968,611	9.4
1923	3,660,478	8,984,811	530,875	13.2
1924	2,808,643	7,864,202	282,720	11.0
1925	4,340,304	8,346,740	439,735	13.1
1926	5,146,904	8,341,535	501,270	14.0
1927	4,603,064	6,247,016	868,930	11.7
1928	6,779,325	6,026,067	638,600	13.4
1929	6,779,325	6,402,696	454,460	13.6
1930	4,574,516	4,426,951	676,110	9.7
1931	3,068,143	2,588,746	108,206	5.8
1932	1,776,685	1,254,131	146,010	3.2
1933	3,179,666	1,506,158	147,473	4.8
1934	4,040,514	2,010,778	184,391	6.1
1935	5,943,208	1,557,706	196,512	7.7
1936	6,861,690	3,481,552	553,571	10.9
1937	6,397,352	4,411,967	661,567	11.5
1938	3,252,772	1,385,057	257,625	4.9

² Average of 1926-1939 black plate production is 2,239,352 net tons. Cold reduced capacity now is 2,248,000 tons, with about 500,000 tons of additional capacity planned in new mills, and in old mills being sped up from 1000 ft. per min. to over 1500 ft. per min. (New Irvin mill will have speed of 2400 ft. per min.) In 1928, there was 0 per cent tin plate cold reduced; in 1930, 0.2 per cent; 1932, 5.5 per cent; 1934, 12.7 per cent; in 1936, 22.2 per cent; 1937, 35.5 per cent; 1938, 65.4 per cent; 1939, a probable 78 per cent cold reduced. What the future holds for remaining hot reduced capacity operating in this country can be pretty well deduced from the trend of these data.

put was cold reduced, as against 0 per cent cold reduced in 1926.²

As already indicated, the slope of the trend line in Fig. 1 is negative. Construction and shipbuilding are large outlets but are erratic and show no over-all growth. Possibility of export is being progressively reduced by the self-sufficiency hysteria of countries large and small. The slight rise in tin plate cancels out the bulk of the decline in steel for transportation. There has also been some improvement in miscellaneous demands—filing cabinets, ash trays, home appliances, and innumerable other items. The growth of these miscellaneous outlets, however, has been and will increasingly be kept in check by plastics and die castings, two young industries still flexing their muscles. As for some new and large user of steel, it is difficult to conjure any such item. Steel houses have extreme difficulty in filling such a role, and no other possibility is currently in sight.

A flattening of the steel consumption curve could not be conceived by most makers in the ebullient late '20's, and as late as, say, 1929, practically no steel maker in the country had recognized a potential drastic shift in types of steel for consumption in this country, from a preponderance of heavy steel to a preponderance of light steel (one of several exceptions being Inland Steel Co., which weathered the

storms of depression in comparatively fine form). Most producers were caught off guard by the whirlwind of depression and just during the period of zero inclination for new construction had to undergo major production alterations to grab their shares of the shifting demands.

This dramatic shift in consumer demands toward flat rolled light steel (and cold reduced rather than pack rolled tin plate) has become a commonplace observation, but viewed graphically in Fig. 3, it is particularly pronounced. To construct this curve, for each year back to 1920 (which was about seven years before the continuous sheet mill was developed) all items that could possibly pass through a continuous mill were accumulated—strip, sheet, skelp, tin plate, arbitrarily one-half the plate produced, but no proportion of the shapes. The total of possible continuous mill items for each year constitute a certain percentage of all steel produced, and these percentages are graphed in Fig. 3. Note the slow increase in dominance of continuous mill items during the '20's, the

spectacular survival during the depression, and their maintenance of greater prominence during the post-depression years.

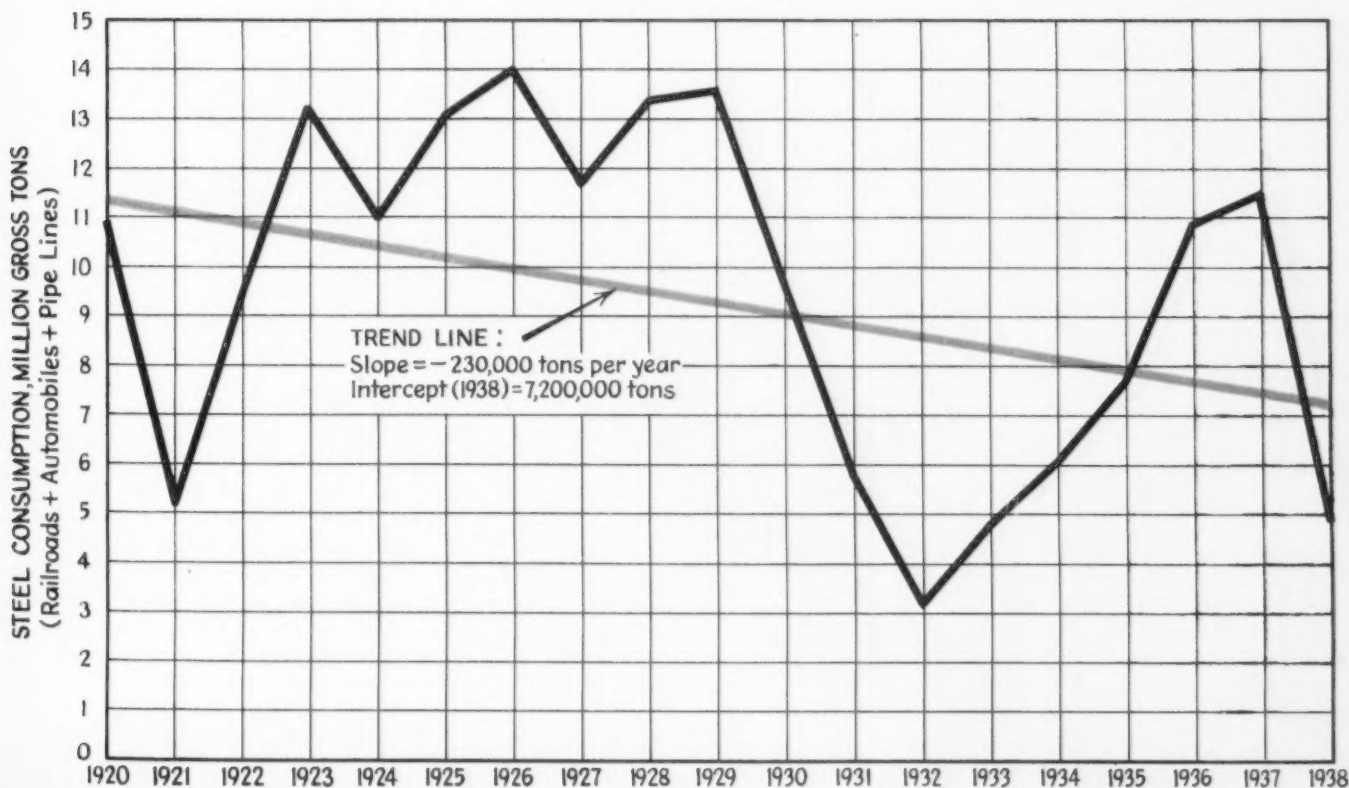
Thus was the genesis of the huge plunge into continuous mills which only this year sees the practical end. About 16,000,000 gross tons of light plate sheet and strip continuous and semi-continuous mills went into production in the past decade, constituting the most drastic and most costly metamorphosis in steel making in the history of the industry. Now, the continuous mill is the funnel through which pours major steel items. Sheet and strip, pipe and tubes (welded), tin plate, structural shapes (mostly light), plates (light for railroad cars and up to 1-in. for ships), reinforcing steel (expanded sheets), etc., and about all that remains is for some long haired expert to devise a railroad rail formed from strip, or for the steel industry to follow non-ferrous experiments in the slitting of strip into square wire and drawing it down to fine rounds. When that happens, then will the continuous mill be the progenitor of practically all finished steel tonnage.

FIG. 2

IN 19 years the steel going into transportation has followed a negative trend. The fall-off may not be so severe as indicated here, but the pattern at best is not very satisfactory.

Inventories Are Relative

Granted that the 95 per cent operations late last year constituted a temporary bulge in the production curve, far above the normal trend line. What,



then, were the specific causes of the bulge?

Of particular interest was the rapid rise in tin plate shipments, at a time when major fruit and vegetable packs over the country were either over or falling off. Much of this excess tin plate actually went into consumption. The several large can makers had the biggest cut of tin plate in their history in September for tremendous (and probably record) packs of fish and meat—for shipment to Canada.

The auto assemblies in fourth quarter were sub-seasonal (because of Chrysler strike) but sheet purchases were most brisk, an unknown but definite tonnage being stacked against first quarter needs. Structural material was pretty well stalled at dead center, but there was a legitimate bulge in pipe production particularly in $\frac{3}{4}$ in. and other sizes under $2\frac{1}{2}$ in. to take care of a spate of small home construction. Plates, particularly $\frac{3}{4}$ in. and under, showed a sharp rise late in the quarter, based on heavy railroad car repair and construction. Rails showed a good rise, and wire hit a peak and started to drop off before the end of the quarter.

These jumps in legitimate demands alone did not make up the 90-95 per cent operations. War engendered demands of a speculative nature, gave a final fillip to the production figure, and it was only because of commendable efforts on the part of steel makers that this speculation was kept within safe bounds.

Of course, the amount of inventory accumulation has been far from excessive, just so long as sentiment regard-

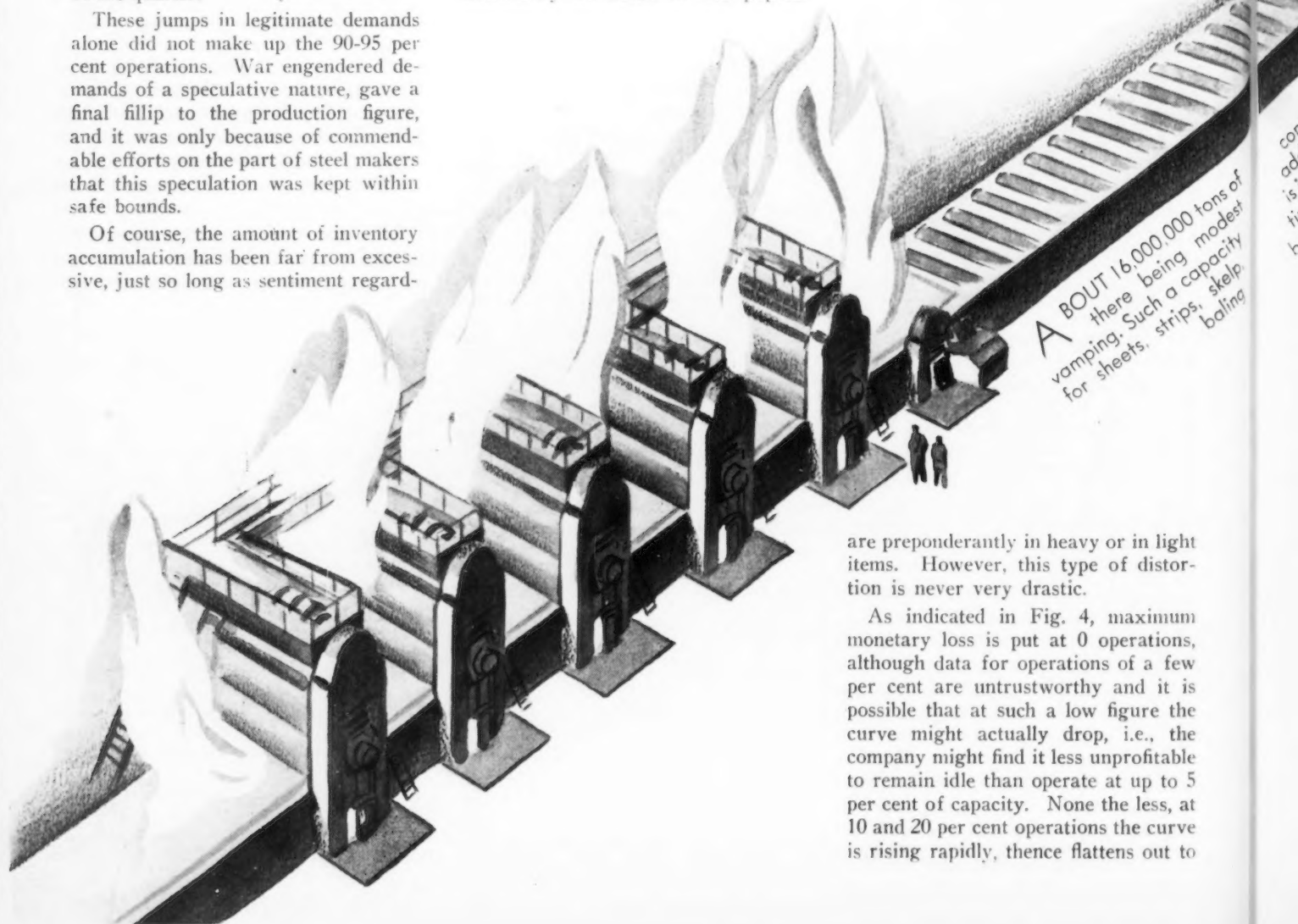
ing business is buoyant. Inventory size is a purely relative matter—a state of mind. Even a sub-normal inventory is far too much during a deflationary spiral, and anything above normal is welcomed during a sharp business recovery. However, the change from one sentiment to another can be very fast and very drastic, as an examination of the 1937 experience will indicate. Just who will be "it" in the popular game of "inventory, inventory, who's got the inventory," will be based on a simple indeterminate factor—how the majority of buyers feel some morning as they jump out of bed as regards price trends and war uncertainties.

90 Per Cent Unprofitable

While a few of the steel makers may be concerned with the abnormal rate of recent steel-making operations purely on a statistical basis, other percipient producers view 100 per cent operations in their plants with antipathy—the antipathy of the dollars-and-cents mentality with the knowledge that capacity operations are not the most profitable operations. Revision must necessarily be made in the popular

concept that the profit curve rises constantly with the amount of steel shipped and is still rising at that point where the open hearth, the rolling mill and the wire block are being squeezed of their last pound of steel. It's certainly true that those few producers who have examined their profit-production curves have been disconcerted by its pattern, a pattern not understandable to the salesman mentality which ties maximum profits to maximum sales.

The writer has examined private production-profit data of two large steel companies—both integrated producers and both makers of practically all types of steels, from fine wire to structural shapes and including low alloy steels. Thrown together, these data give the curve in Fig. 4. The curve near 100 per cent operations, of course, involves pretty balanced production between heavy and light items, and in this instance the pattern of the curve from 0 to 50-60 per cent also involves rather balanced production—at times this lower section of the curve undergoes some distortion when sales



are preponderantly in heavy or in light items. However, this type of distortion is never very drastic.

As indicated in Fig. 4, maximum monetary loss is put at 0 operations, although data for operations of a few per cent are untrustworthy and it is possible that at such a low figure the curve might actually drop, i.e., the company might find it less unprofitable to remain idle than operate at up to 5 per cent of capacity. None the less, at 10 and 20 per cent operations the curve is rising rapidly, thence flattens out to

cross into the profit zone at very near 45 per cent of capacity operations. From then on the profit curve rises rapidly, there being two little jiggles, one at about 48 per cent and one near 55 per cent, neither of which is explained satisfactorily. The slope of the curve is flattening rapidly at 80 per cent, and its apogee is in the immediate neighborhood of 90 per cent. From then on, profit slides off rapidly as operations approach the theoretical 100 per cent operations.

backlogs and captious customers, old machinery is pulled out of dark corners, hastily set up and placed in operation. New men are half trained for precision operations. Scrap losses mount abnormally. Bloated repair and maintenance figures go onto the balance sheet. Operating men start stumbling over each other and are busily dodging the erratic demands of their commercial associates. The result is the squeezing out of additional shipments, but such tonnage is costly to the mill. The smarter operating men well know that the only safe solution to old or unprofitable capacity, be it a rolling mill, an open hearth, a blast furnace or an incidental machine, is to scrap it. So long as it is lying around with any semblance of workability, salesmen in times of capacity demand will sell tonnage requiring its use and then raise so much hell that operating departments have to hastily refurbish and kick it into some form of production.

As previously stated, the data in Fig. 4 come from two large integrated steel mills. A very similar curve probably applies to the steel industry as a whole. Of course, there may be some units which may not follow this curve—smaller plants, for instance, which have considerable new equipment and have scrapped all older units. Among several prominent high alloy makers, inquiry has disclosed that the apex of the curve is more nearly 94 to 95 per cent, the shift to the right probably being due to the comparative smallness of plant, specialization of product and close control over all manufacturing operations.

The curve well explains the displeasure of many steel makers with capacity operations for the last several months of last year. Their reassuring statements, their private belligerence to hold buying pressure down to some semblance of reasonableness, sprang both from fear of reaction to a buying jag and also from the hard headed realization that if buyers are so damn anxious to get steel they should exert some effort to present demands sensibly and permit steel makers to operate in the more profitable sections of the curve.

Export Takes Up Slack

Up to the present time the steel industry has been somewhat disdainful of the tentative feelers for export tonnages kicking around the market—disdainful as only the steel industry can be when domestic demands are swamping facilities. In fact, there has actually been not a little denial that the war has anything to do with current operations and more than one high minded observation that the industry has no use for and does not want war business. But will there be as much high mindedness in May as there was in December? Hardly likely. Nor should there be.

A major war today, any place in this world made small by transportation and communication, is an exhilarant. But like any exhilaration, there is a serious letdown. The letdown may be immediate or protracted, but it comes. In this country, the fourth quarter showed promise of pretty satisfactory activity—then suddenly with declaration of war the industrial production index shoots up to equal the peak period of 1929. Certainly it is true that in steel less than 10 per cent of production was going to the military and comparatively nothing abroad, but just the same to war goes the credit for the scramble for supplies which was just the fillip needed to push production up to capacity.

There is no gainsaying the fact that the record shows that the steel industry can not long justify the activity displayed late in fourth quarter. A

continuous mill capacity has been built in 10 years, additions in prospect due to construction and re-tin plate, light plate, piling, hoops, cotton ties and bands.

Both of these large companies, on the basis of curves of this type, bemoan the fact that capacity operations not only borrow against future output, but actually *account for monetary losses*. As regards what the balance sheet might show after capacity operations for a full quarter, the companies might just as well have operated at about 80 per cent of capacity.

It is quite obvious from the curve why steel plants, if they were to be free agents, would like to keep operations from rising above 85 per cent. What causes this severe drop-off at 90 per cent? More enters into it than classical corrective factors arising from the exceeding of a critical economic capacity, i.e., a capacity for output which can be sustained for an indefinite period without additions to plant, while having a certain proportion of plant always idle undergoing repairs and reconditioning.

Under the pressure of excessive

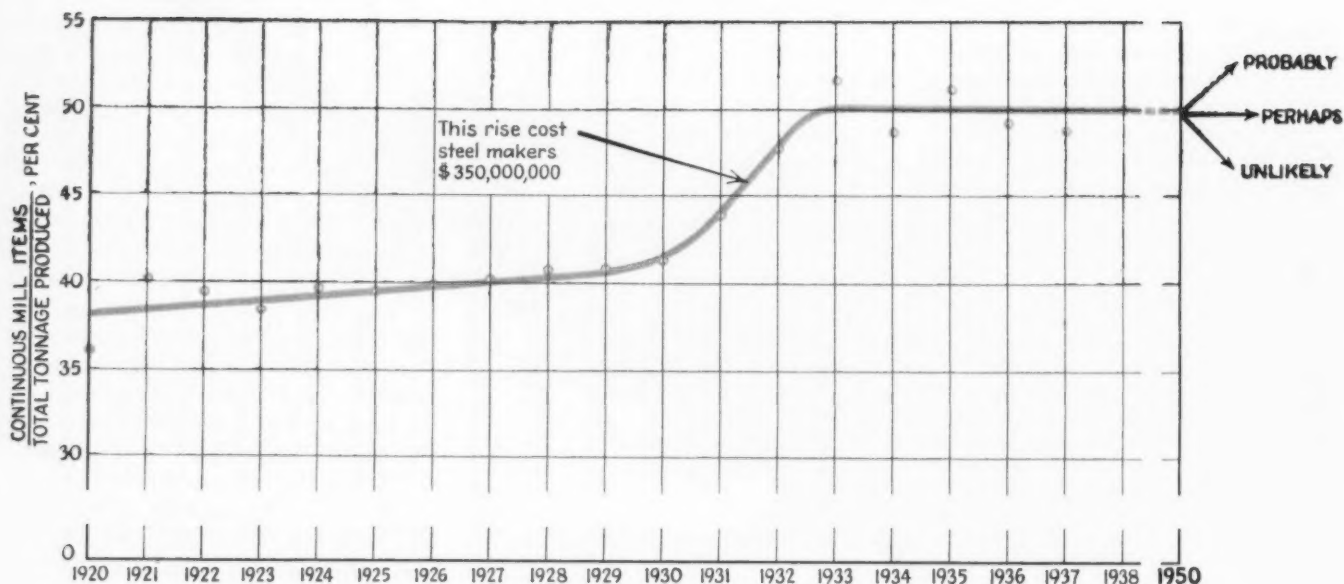


FIG. 3

THE factors requiring continuous mill construction during the depression have often been described. This group of data, however, particularly emphasizes the inevitability of the drastic change in production technique.

long sojourn far above the trend line of Fig. 1 either means trouble ahead or the trend line has no meaning. The writer prefers to think the former will rule. So far the record steel shipments of last quarter have been far from serious—the rise has been too rapid, corrective actions have been prompt, and the spotlight of attention has been too closely directed to the dangers arising from the maintenance of such a rate for a very long period of time.

It is to be hoped that home demands soon taper to more normal level. When they do, then export will assume greater prominence. Certain of the warring nations can be depended upon to come to this country for steel in a volume dictated by the duration and extension of this unpredictable conflict. Money will be made available for the purchase of such steel, because money can always be found in war time. And when orders backed by cash are available, and voracious continuous mills

are swallowing domestic backlogs, then will management follow the obvious course and accept the orders. Nor would labor nor anyone else recommend any other action.

The real danger to industry today is just the same as it was 25 years ago, a danger well recognized now but one which possibly could be blacked out by a wave of ideological hysteria. With foreign orders in mills, the steel man may become too accustomed to high operations and develop an affinity of interest and a sentimental attachment for a good customer. If then the customer's money should run low or the customer should run into trouble, there might follow a degree of sympathetic support for some means to make credits available—just as a favor to a good customer and also perhaps to keep operating rates up. Or, under the combined pressure of foreign demands and an upsurge in home demands, a tendency might develop to expand production capacity, all well justified perhaps by resounding arguments.

Either course means a trip down the long dreary road that industry has taken in the past. The former possibility could constitute one long step in the direction of participation in the war. The latter possibility might be the basis for a period of bloated production and expansion—the aftermath of such a period is conveniently visualized by examining what followed a similar period in the steel operating rate, Fig. 1.

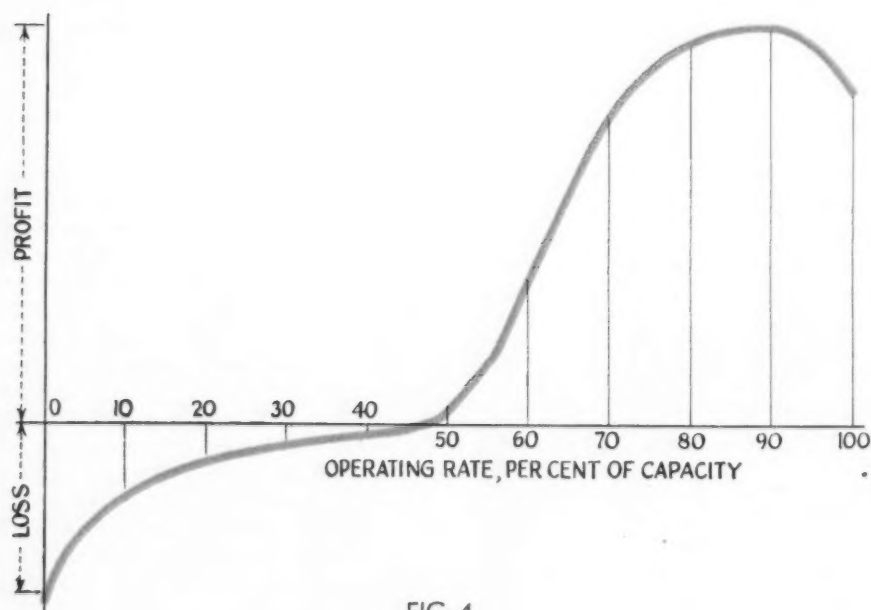


FIG. 4

OPERATING near 90 per cent of capacity results in maximum profits for several large steel mills. One hundred per cent operations eat into profits.



EMERGENCY powers threaten INDUSTRY

OVERWHELMING American sentiment against this country's getting mixed up in the European war has made Congress conscious as never before of the enormous emergency powers vested in the President of the United States. In consequence sharp impetus has been given to a move to curb these powers.

The movement has also directed additional support to the Logan-Walter Administrative Law bill. This measure is aimed not at emergency powers but rather at far-reaching administrative functions of quasi-judicial executive agencies. Since the advent of the New Deal, these extraordinary powers have been granted for normal peace-time application and, it is charged, have been widely abused.

By L. W. MOFFETT

Washington Editor, The Iron Age

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Of pressing concern, however, are emergency powers and their possible misuse under present conditions of international turmoil. The subject promises to become an outstanding issue at the session which convened on Wednesday of the present week, as well as in the Presidential campaign which will soon open in full blast. What Congress may immediately do about it, if anything, remains to be seen. But the subject is the object of widespread discussion and sooner or later something may be done to limit these powers. The chief concern

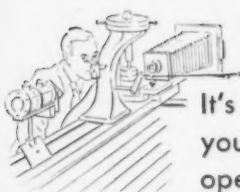
is not over war-time powers. They are virtually unlimited and with certain reservations such as unwarranted confiscation it is commonly accepted that they should be broad. By necessity democracy goes out of the window under actual war conditions. What amounts to a dictatorship over the economic and even the social life of the country is established.

Congressional anxiety relates particularly to discretionary authority given the President to proclaim a state of emergency and assume sweeping control of business, labor, finance, agriculture and other private fields. Abuse of such authority is feared. Long prior to the outbreak of the European war, words and gestures from the Administration were inter-

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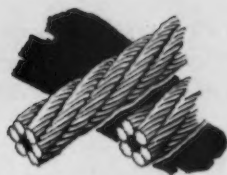
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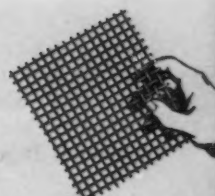
FLAT WIRE



WELDING WIRE



ELECTRIC WIRE



WIRE FABRIC

puted as having a belligerent tone and aroused growing apprehension of the country. Then, as the European war clouds darkened, moves made led to the impression that Washington considered it inevitable that the United States would become involved in the conflict. Concern was deepened when the President on Sept. 8, 1939, declared a state of "limited emergency" under authority of an old law and followed it with an order to increase the military forces, acts in themselves that were not alarming. Their connotation was a source of anxiety, however, because suspicion developed that they reflected a trend toward war. Even as it was, charges were made that the proclamations were designed to remove the statutory limitation which requires appropriations to be expended more or less equally over the months of a fiscal year.

The movement for a survey of emergency powers with a view to restricting them is non-partisan in character and is not directed at any individual President. For they are powers that were vested in the Chief Executive beginning with the administration of John Adams, the second President, down to the present time. Many of these powers lie obscurely in old statutes, a large number of which are the outgrowth of wars, beginning with the second war with England and running through the Civil, the Spanish-American and World wars. By this and subsequent legislation there are thrust upon the President extraordinary powers "when war is imminent" or in the event of a "national emergency." It is left entirely to the President to determine for himself "when war is imminent" or when a "national emergency" exists. He does not have to get the slightest nod of approval from Congress.

Emergency Powers are Broad

What are these powers and how many are there of them? No one knows. Not even the Attorney General of the United States. In a report to the Senate on Sept. 4, 1939, in response to a resolution introduced by Senator Vandenberg, Republican of Michigan, Attorney General Frank Murphy cited a formidable list of about 100, and then figuratively threw up his hands. The list was far from complete. But the provisions were sufficiently numerous and potent to show the wide authority resting in the Chief Executive in war or, more important, when he finds an emergency exists. Even greater power, in times of emergency, is proposed in some bills now pending in Congress, affecting indus-

trial mobilization plans and taxing power, by which business would be regimented with the utmost rigidity.

In his report on Presidential powers, Attorney General Murphy said:

"The Executive has powers not enumerated in the statutes—powers derived not from statutory grants but from the Constitution. It is universally recognized that the constitutional duties of the Executive carry with them the constitutional powers necessary for their proper performance. These constitutional powers have never been specifically defined and, in fact, cannot be since their extent and limitations depend largely upon conditions and circumstances. In a measure this is true with respect to most of the powers of the Executive, both constitutional and statutory. The right to take specific action might not exist under one state of facts, while under another it might be the absolute duty of the Executive to take such action."

In addition to hang-over powers from old statutes, it is well known that Congress, made jittery over a clamor from the country due to an economic upheaval, surrendered extensive powers and gave them to President Roosevelt. The President himself recognized the fact, though in doing so, asked for more power to spend money.

In his annual message to Congress, Jan. 3, 1936, Mr. Roosevelt said:

"... we have built up new instruments of public power. In the hands of a people's government this power is wholesome and proper. But in the hands of political puppets of an economic autocracy such power would provide shackles for the liberties of the people."

Powers now in the hands of the President are so broad that by emergency proclamations he can, under the National Defense Act of 1916, have an order placed with an industrial plant, make performance and priority obligatory and have a reasonable price determined by the Secretary of War. If the manufacturer should refuse to give priority or furnish the product at the price fixed, his plant can be seized for the duration of the war or period during which war is imminent.

War-Time Powers Sweeping

The Industrial Mobilization plan provided for by the act was studied and improved recently by the now disbanded War Resources Board, which was headed by Chairman Edward R. Stettinius, Jr., of the United States Steel Corp. No doubt this plan either as proposed or in revised form would

be readily effectuated in the event of a war emergency. But already there are bills pending which would grant even more vast Government powers than this far-reaching plan contemplates for control of industry. These plans generally have been outlined in *THE IRON AGE*. They provide for such controls as price fixing, commandeering, power to buy and sell, conservation measures and others. Labor and agriculture as well as finance necessarily are included in the plans. Since they pertain to war-time conditions, objection to them is weakened, though it exists because such powers have been abused.

Quite different is the attitude toward granting the Chief Executive extraordinary emergency blank check powers. While wide emergency powers are bound to be placed in the President, there is a definite conviction that some now existing, old and new, should be curbed or guarded against abuse. The problem before Congress therefore is to study these powers and, after careful analysis, determine those which should be taken away or continued.

Some of the Executive Powers

Provisions of some of these Executive powers are briefly stated as follows:

Authority to requisition aircraft or shipbuilding plant or war material, regardless of whether owners have a Government contract—National Emergency Fund Act, March 4, 1917.

Authority to take preference and priority for transportation of materials by certifying to the Interstate Commerce Commission that these materials are necessary—Commerce Act amendment, Feb. 28, 1920.

Authority in time of war or threatened war to demand preference for all traffic for transportation of troops or materials of war—Acts of Feb. 4, 1887, June 29, 1906, Aug. 29, 1916.

Authority through Maritime Commission during any national emergency to requisition any vessel documented under the laws of the United States provided just compensation is made and to revoke all charters issued by commission—Merchant Marine Act, June 29, 1936.

Authority during war or threat of war, or a state of public peril or disaster, to close any radio station and remove the equipment or authorize any department of the Government to use such a station under regulations that the President may prescribe. Such powers may be exercised if he thinks

it necessary to preserve the neutrality of the United States—Communications Act, June 19, 1934.

Authority when public exigency requires to procure articles or services by open purchase or contract even though normally purchased by competitive bidding. — Act of June 25, 1910.

Authority to suspend the Federal Eight Hour and the Bacon-Davis laws, and to exempt contracts from the operation of the Walsh-Healey Act.

Such extensive emergency powers as those to close the banks and stock exchanges were exercised by President Roosevelt immediately after his first inauguration to check a panic and under the circumstances met with the nation's approval. Even though they could be abused, it is doubted that Congress will seek to curb them. The power, within limits, to change the gold content of the dollar was also exercised and still applies, an action that has been both bitterly criticised and warmly defended. Control over the power resources, in addition to

control over coal and petroleum, rests in the Federal Power Commission, which in peace time or war, can require stated temporary connections of facilities for transmission of electric energy to prevent shortage.

Other Extraordinary Powers

Extraordinary, rather than emergency powers, are vested in other acts. One of them, the Reciprocal Trade Act, gives the Chief Executive authority to increase or lower duties and many trade agreements have been negotiated under the act, duties obviously being reduced in all instances. The act has a zealous supporter in Secretary of State Cordell Hull who is fighting with all his might to head off powerful groups in Congress, chiefly representing Western mining and agricultural interests, who want the act killed permanently upon its expiration in June of the present year. Crop control and price fixing of agricultural products are not directly provided for in the numerous acts affecting agriculture but are achieved through sub-

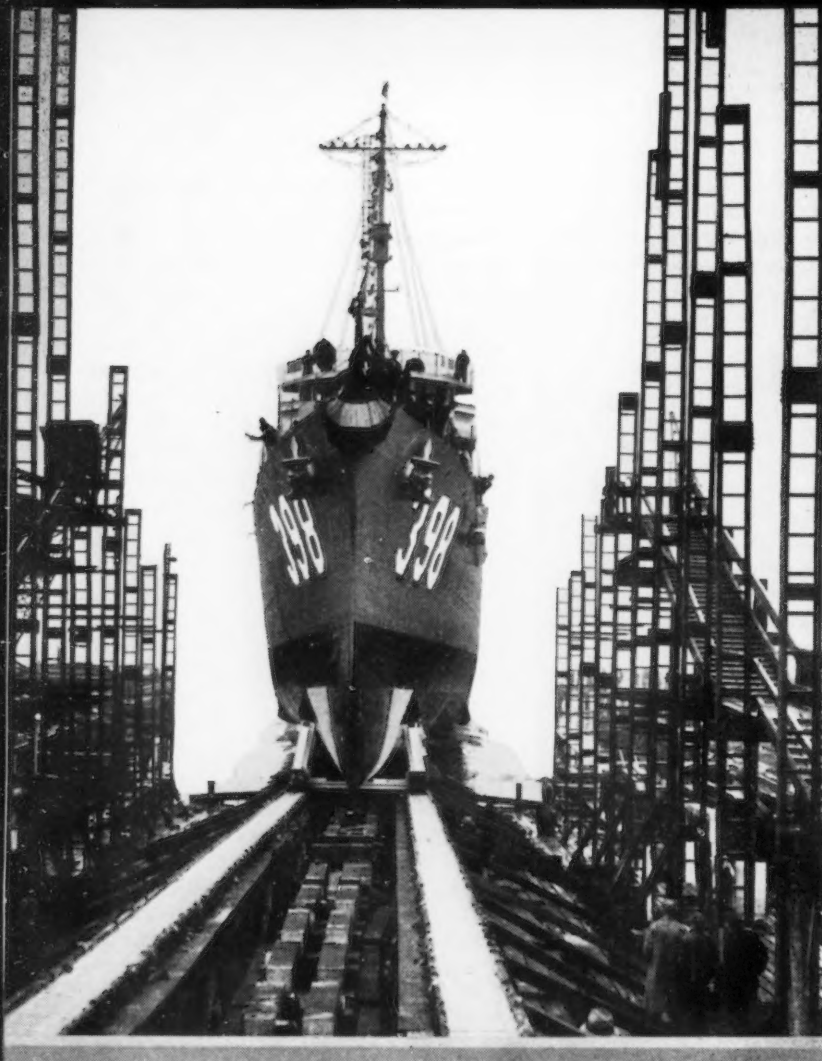
sidies and lending and insurance provisions.

The arms embargo provision of the Neutrality Act of May 1, 1937, was repealed at the recent special session of Congress after heated debate. The Administration asked for repeal. Nevertheless Congress specified severely restrictive provisions governing American shipping as it declined to grant the Administration its desire to exercise its own discretion under international law. A cash and carry system which expired May 1, 1939, was restored in the revised law. Numerous loopholes remain to be worked out.

"Come and get it," belligerents now are told. "Pay for it, take title and haul it away in your own ships." The chief immediate effect of lifting of the embargo was to release orders for and shipments of American-made "arms, ammunition, and implements of war," particularly war planes, to England and France as well as to Canada. These shipments, however, so far have not been so large as had been predicted.

(CONTINUED ON PAGE 143)





UNCLE SHINES HIS ARMOR

JAMES G. ELLIS

*Associate Washington Editor
The Iron Age*

FOR the second successive year United States expenditures for armaments will reach an unprecedented peace-time figure, and for the second successive year Congress comes back to Washington with the subject of national defense heading the list of all others waiting Congressional action. The question of how long the country will continue to spend at the rate of \$2,000,000,000 a year for defense purposes probably can only be answered by subsequent developments across the seas.

To the capital goods industries this means a continuance of the present high volume of business with all the concomitant production problems which in some instances involve additional facilities and plant expansion, leaving the private manufacturer, based on World War experience, holding the bag. On the War and Navy departments rests a burden of tremendous proportions, bringing the first serious pinch from Congressional efforts to improve labor's lot by asserting through Government contracts affirmative control of wages, hours and working conditions.

To the politician in Washington the defense program and the European situation spell continuance in office and to John Q. Taxpayer these developments mean taxes over and above those to be paid on that inevitable day when back-breaking New Deal expenditures must be written off the books.

Last year President Roosevelt's defense program was approved virtually as recommended. This year a \$2,000,000,000 program in view of the world outlook is no longer a controversial issue but controversy still surrounds the method by which the program will be financed. Despite talk of a two budget system—Budget A for normal defense and Budget B for \$500,000,000 of expenses resulting from the European war—and despite trial balloons on financing on a pay-as-you-go basis, the paraphrase theme song on Capitol Hill is still "millions for defense but not one cent for taxes"—at least not in an election year.

To grasp the effect of new defense appropriations, the distribution of the \$2,000,000,000 appropriated last year

for use during the current fiscal year is the best starting point.

Congress appropriated funds for these purposes:

Regular naval supply—\$663,049,151, representing an increase of \$142,876,047 over the previous year. Roughly 63 per cent of the increase was due to aircraft expansion to a minimum of 3000 planes and to new ship construction under which contracts were awarded for two 45,000-ton battleships, eight destroyers, eight submarines, two seaplane tenders and one repair ship. Bids for two 10,000-ton cruisers have been called for Jan. 31. For ship replacement Congress appropriated \$270,000,000; for Bureau of Aeronautics, \$88,298,000.

Naval expansion—authorized was \$63,000,000 but not more than one-third will probably be spent before next June in work started on 12 new air bases.

Naval modernization—repairs for battleships *Tennessee*, *California*, *Colorado*, *Maryland*, and *West Virginia*, \$2,000,000 each. To supplement modernization funds previously appropriated, \$6,000,000.

Naval public works—for dock at Pearl Harbor, \$8,485,000; for new drydock at an undesignated location \$6,000,000; for purchasing Hunters Point drydock or alternative location, \$4,000,000; for facilities at Paris Island, \$3,000,000; for ship repair facilities at South Boston drydock \$2,500,000; for Philadelphia aircraft factory, \$1,800,000; or a total figure of \$55,000,000.

Maritime Commission—received \$100,000,000 in cash; \$235,000,000 in new contract authority. Ships ordered since January, 1939, total 91, including 41 ships on this year's quota. Expects to order nine ships this year, at least two of which will be passenger liners.

Seacoast defenses—including Panama and Hawaii, \$8,000,000; \$277,000,000 authorized for additional locks at Panama Canal but no funds were actually appropriated. Coast Guard received \$25,003,210 for all purposes, including 15 long-range seaplanes and three new cutters.

Regular army supply—out of \$548,995,812, including contract authority for all items, the Air Corps got \$74,220,637 for all purposes, including funds for previously-ordered aircraft and \$1,000,000 for research; Ordnance Department got \$30,420,711; Signal Corps, \$4,878,836. Under second deficiency bill, the Army received \$300,000 for rotary wing aircraft development.

Army expansion—out of \$361,000,000 authorized for Air Corps to expand its force to 6000 airplanes, and for Panama Canal garrisons, \$14,500,000 was appropriated for the current fiscal year for awarding educational orders. None of the \$14,500,000 has been spent, although \$2,000,000 worth of such orders were placed under a previous appropriation. Of the \$361,000,000 authorized, all funds were appropriated excluding an \$18,250,000 authorization for future orders program.

Arsenal machine tools—\$6,000,000 to replace obsolete equipment in the six arsenals to insure greater capacity as the first initial step in \$16,000,000 modernization program.

Critical weapons—including cash and contract authority, \$110,000,000 for buying anti-aircraft and anti-tank guns, tanks, gas masks, automatic rifles and artillery.

Strategic and critical materials—authorized to be appropriated over a four-year period was \$100,000,000 to build up stocks of war materials of which the country has an inadequate supply. Actually appropriated was \$10,000,000, of which slightly more

than one-third is covered by contracts awarded for manganese, chromium, tungsten, pig tin and optical glass.

Army Air Corps bases—\$62,000,000 of available funds for construction of new air bases, including bases at Panama, Puerto Rico, Hawaii and Alaska.

Aviation research and pilot training—contract authority, \$10,000,000 for research plus \$1,890,980 in cash for construction of a new plant at an undesignated location. For pilot training, \$4,000,000 was appropriated.

In terms of direct orders placed during the last six months, this \$2,000,000,000 program has resulted in these contracts, as reported to the Labor Department's public contract division:

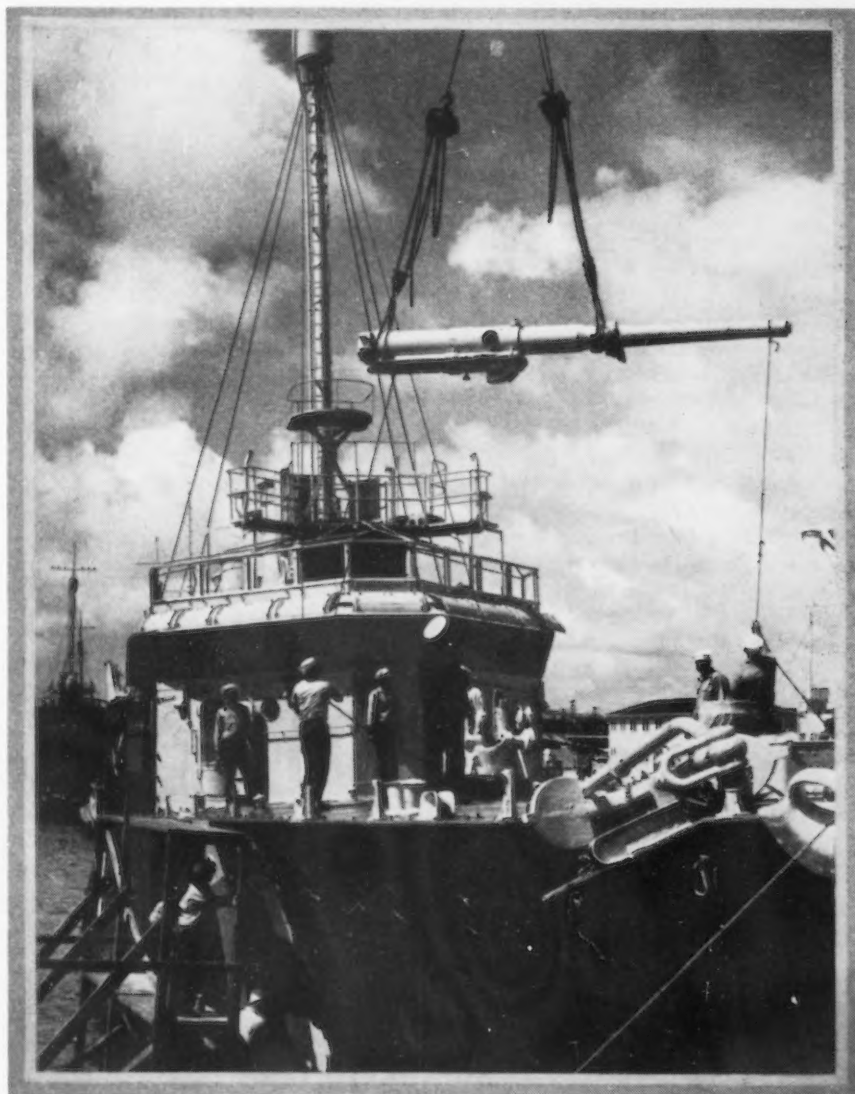
Awarded by the War Department—for iron and steel products, \$18,646,903; for machinery, \$6,450,617; for electrical apparatus and supplies, \$13,568,028; and for all types of transportation equipment, \$103,073,703.

Awarded by the Navy—for iron and steel products, \$26,881,058; for machinery, \$15,394,249; for electrical apparatus and supplies, \$2,267,848; and for all types of transportation equipment, \$138,874,066.

Broken down further, selected expenditures are listed in the accompanying table.

Naval Expansion Proposed

With another \$2,000,000,000 of defense appropriations for the next fiscal year beginning next July 1, these direct orders are expected to continue at the same rates barring unforeseen developments. A \$1,300,000,000 naval expansion bill, calling for a 25 per cent increase in tonnage, or 5 per cent greater than that provided under the naval expansion act of 1937, is expected to meet little opposition. It would provide for the construction of three aircraft carriers, eight cruisers,



SIX MONTHS OF STEEL AWARDS FOR NATIONAL DEFENSE

(From contracts announced since June, 1939)

	War Department	Navy Department	Total
Plain steel and armor plate	\$1,619,403	\$19,799,461	\$21,418,864
Machine tools	3,856,476	2,588,929	6,445,405
Tools, jigs, dies and gages	172,348	162,006	334,354
Forgings and castings	218,965	3,474,339	3,693,304
Aircraft, engines, and parts	101,056,029	13,349,457	114,405,486
Guns, bombs, small arms	12,043,294	16,293	12,059,587
Total			\$158,357,000

52 destroyers, 32 submarines and 31 auxiliary vessels, making a total of 126 new ships in the combatant and non-combatant category.

With Government orders for defense on the increase, the difficulties entailed become a major problem to the War and Navy officials and to private firms. While seeking Government business is frequently regarded as an experience in which only the larger companies can afford to indulge, even the large units in the steel industry have not gone out aggressively after Government contracts. Recent testimony before the Temporary National Economic Committee showed that the practice in times past has been to adhere to base prices in quoting on Government work while at the same time offering substantial concessions from base prices when seeking private contracts.

The volume of Government steel business has been described as "just a flea bite" but nevertheless, with the recent growth of Government functions, to which has been added a two-billion-dollar-a-year defense program, the fleas—alphabetical fleas—have been multiplying and biting more people. As for the purchase of all commodities, the combined agencies of the Federal Government probably represent the largest purchasing agent in the market and the two departments controlling the armed forces are currently dispensing the lion's share of the business.

Government Purchasing Hampered

Private companies getting their first taste of Government contracts find that there is more involved than the axiomatic procedure of advertising, bidding and awarding contracts to the lowest responsible bidder. As a general rule, the Government is controlled by the same principles of law applicable to contracts between private companies, yet it should not be overlooked that the United States is a sovereign as well as a contractor. Hence, the courts have recognized certain exceptions to the general rule; but these

exceptions are relatively insignificant as contrasted with restrictions imposed on contractors by Congressional mandate.

Two opposing forces are constantly at work on Government contract policies. One, which includes the Army, Navy and other Government agencies, is attempting to improve the purchasing procedure so as to make it conform as nearly as possible to commercial methods. The other is centered in the Department of Labor, through which organized labor seeks to assert governmental control over wages and hours and working conditions in local employment.

Through the efforts of this latter force, the vast spending power of the Government has been fashioned into bureaucratic control of labor conditions in industry, the net effect of which has been to hamper the national defense program and to substantially increase defense costs.

Unfortunately for industry, the trend is toward an increasing number of laws peculiar to Government contracts, tending to widen the gap between Government and commercial purchasing methods. In brief, there are about nine laws which now require stipulations in bids issued for Govern-

ment supplies and, while they are not all applicable to the same materials, contracts for some often involve as many as four or five of these redundant stipulations.

What with Government specifications, worrying about performance bonds, liquidated damage provisions, keeping material and workmanship available for inspection when required and complying with labor provisions imposed, the average contractor, particularly the small company, has considerable apprehension about taking Government contracts. Statutes specifying labor standards, profit limitations, and regulations imposing miscellaneous conditions designed to effectuate various governmental policies constitute the three major types of hurdles over which private firms must jump in order to get the business.

Walsh-Healey Act a "Headache"

At the head of the list of laws whose provisions are tightening their strangle-hold on Government purchasing procedure is the Walsh-Healey Public Contracts Act, in which War and Navy officials, already overburdened with more than 220 separate statutory enactments affecting their buying methods, have found litigation, losses and delays.

The Walsh-Healey law imposes minimum wages after standards are determined, and restrict hours, child labor and hazardous working conditions. Penalties for violation include cancellation of contracts, payment of liquidated damages or outright blacklisting from further Government business.

Soon after the law was passed in September, 1936, the Navy encountered such a delay in ordering steel, copper and zinc, that it invoked the emergency statute, permitting the purchase of copper without regard to the usual competitive bidding procedure. While some of the wrinkles have since been ironed out, the law continues to be the No. 1 headache for defense purchasing chiefs.

Comparatively few industries selling supplies to the Navy have been subjected to minimum wage determinations under the law. While a minimum wage was decreed for the steel industry, the order has been tied up by court injunction since last March, but during the brief period it was effective the result, in the words of one naval officer, was to "practically eliminate competition in the industry."

Captain C. W. Fisher, Construction Corps, Navy Department, put it this

(CONTINUED ON PAGE 145)



Steel makes a NEW HIGH But decade shows a HEAVY LOSS



ALTHOUGH the final quarter of 1939 established a new high record in steel production, the year as a whole recorded only a fair total of about 45,950,000 gross tons of open hearth and bessemer ingots, or about 64½ per cent of the industry's capacity.

More significant, perhaps, than the new high production record in the fourth quarter is the fact that 1939 completed the first decade in the history of the American steel industry in which total steel production for a 10-year period was less than that of the preceding decade.

The backsliding of industrial progress during the 1930-39 period is well illustrated by a comparison of the totals of steel ingot production over the past five decades:

	Gross tons
1890-99	59,037,113
1900-09	171,766,984
1910-19	334,955,219
1920-29	426,995,417
1930-39	342,350,000

NOTE: All totals include open hearth, bessemer, electric and crucible steel. Electric and crucible estimated for 1939.

The loss of nearly 85,000,000 tons of ingot production in the 1930-39 decade as compared with the 1920-29 period

can be partly explained by the over-expansion of the early twenties, but other forces which have tended to discourage business enterprise and initiative also played an important part in this poor showing. The fact that the total steel output of the 1930-39 decade was not much above that of the 1910-19 decade, 20 years earlier, offers convincing proof of arrested expansion in the reconstruction and replacement of the nation's facilities.

While it was not to be expected that the rapid growth of steel production of earlier decades would continue as the country reached a stage of mature growth, it is clearly shown by these figures that the replacements necessary to maintain the country's normal progress have not been made. For example, the average yearly output of steel ingots over the past 30 years has been about 36,810,000 tons, yet in only four of the past 10 years did ingot output exceed this average—in 1930, 1936,

1937 and 1939—despite the fact that since the beginning of the 30-year period for which steel production has been averaged the population of the United States has increased nearly 40 millions, in 20 years has increased nearly 25 millions and in 10 years possibly seven or eight millions. Moreover, during this period, and particularly in the past 10 years, the uses for steel have expanded in many directions, indicating greater potential outlets for the future.

Per Capita Use Has Grown

DESPITE the slowing down in growth of population and despite the attainment of industrial self-sufficiency in some lines, the amount of steel in use per capita has increased, suggesting an ultimate need for reconstruction and replacement on a scale which should, under favorable conditions, turn the trend of steel production upward in ensuing decades. The American Iron and Steel Institute has estimated that apparent consumption of finished steel in the United States has grown from 1060 lb. per family in 1900 to 2440 lb. per family in 1937. In the latter year, with steel production averaging 72½ per cent, consump-

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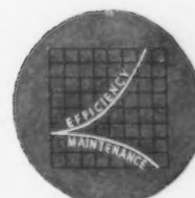
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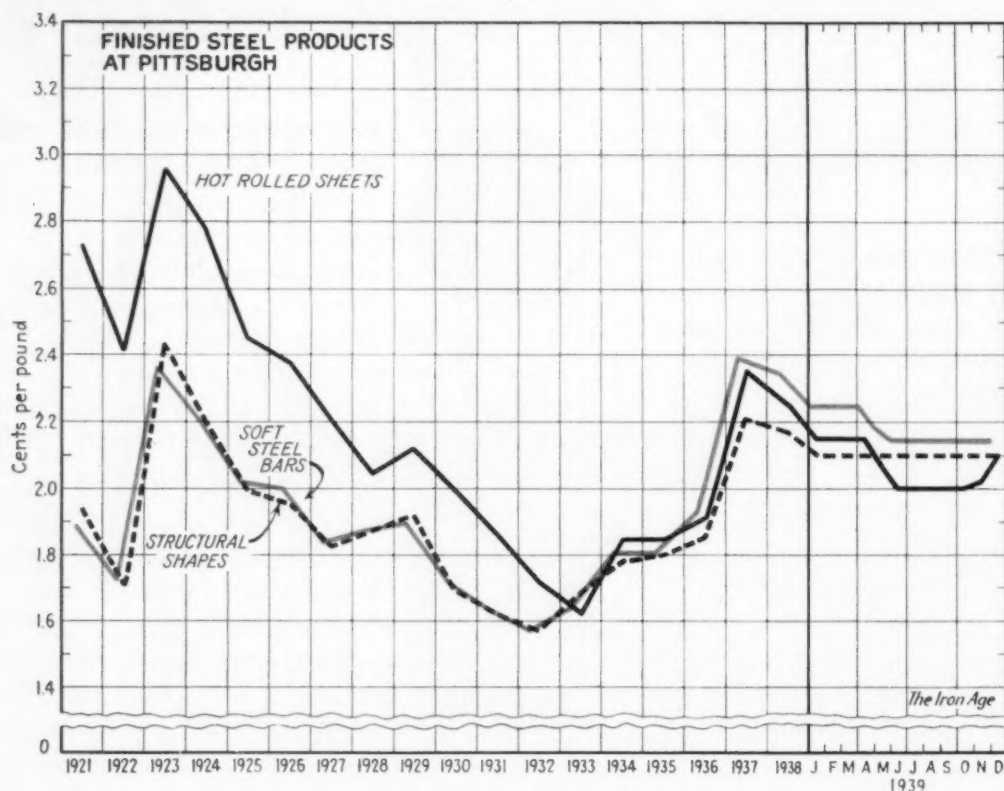
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ULTRANSMISSION COSTS



PRICES of some finished steel products dipped sharply in the first half of 1939, but recovered to a level considerably below the peak of 1937.

tion per family came close to the all-time peak of 2950 lb. per family in 1929, when steel production was 88½ per cent of capacity. While figures of this kind vary from year to year and are easily subject to misinterpretation, there can be no doubt of the fact that steel uses are increasing relatively if not always quantitatively. Wider use of steel in automobiles, refrigerators, in bridge construction, in home construction and in many other ways are visible evidence of the greater part that steel plays in the daily needs of the people of the United States.

That the use of steel in normal amounts has been merely backed up in recent years because of conditions unfavorable for enterprise has been amply demonstrated by the events of the past few months, when fear of scarcity and higher prices induced by war in Europe brought out of hiding a tremendous volume of deferred requirements. Undoubtedly these demands were in excess of needs for immediate consumption, but the rush to buy was accelerated by the fact that inventories of steel and inventories of goods made of steel all along the line had been permitted to decline to extremely low levels. The fact that a large share of the business placed during the last four months of 1939 was to satisfy domestic requirements and was not to an important extent war business or diversion of export business from European countries amply

demonstrates the potential steel needs of the United States.

Largest Three-Month Output

THIS upsurge of orders resulted in production of the largest tonnage of steel during the last three months of 1939 ever turned out in this country during any three-month period. With December estimated, the quarter's total of open hearth and bessemer ingots was around 16,200,000 tons as compared with 15,139,254 tons in the second quarter of 1929, the previous high record for any quarterly period. The past quarter's total even exceeded that of the best consecutive three months of 1929—March, April and May—in which the total production was 15,304,475 tons.

Ingot production in October and November, 1939, exceeded that of the previous record month, May, 1929, and, although official figures for December are not available at this writing, it is indicated that the December total may also have exceeded that of May, 1929. The October total was 5,393,821 tons and that of November was 5,462,616 tons, while the May, 1929, output was 5,286,246 tons. Evidence of the much larger present capacity of the industry is indicated by the fact that production in May, 1929, was at 102 per cent of capacity whereas the November total was 93.26 per cent. In 1929 steel capacity was rated

at 63,784,389 tons against 71,594,320 at present.

Production of pig iron and ferromanganese in 1939, with December estimated, was about 31,515,000 gross tons, a total in excess of that produced in any year since 1929, with the exception of 1937. Although ingot output in October and November exceeded that of May, 1929, pig iron failed by a small margin in November to equal the 1929 record figure.

Rising Trend in Second Half

While steel and pig iron production was somewhat irregular in the first half of 1939, the latter half ushered in a rising trend which probably would have continued throughout the final months of the year even without the conditions produced by the outbreak of war in Europe. Ingot production started in January with a rate for the month of 52.48 per cent, then rose to a first quarter peak of 56.3 in March, with a downward trend in April and May and a renewal of the upward movement in June. The decline in production in April and May was largely due to the bituminous coal strike, which brought about the banking or blowing out of 22 steel company blast furnaces in April. First half steel output was 18,590,780 tons, only about 2,400,000 tons above the total for the final quarter. The second half started with a 52.4 per cent rate in

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July, followed by an upturn to 62.22 per cent in August and 72.41 per cent in September. The October rate was 89.17 per cent, November 93.26 and December was in excess of 90 per cent. Had the war not occurred, it is believed that an autumn peak of at least 75 per cent might have been attained.

Price Cutting Orgy

ACUTE price weakness undoubtedly accounted for some of the irregularity of steel production in the first half of the year. This weakness was most pronounced in May, when for a period of about 10 days steel companies, in an orgy of price cutting, loaded up their books with commitments for sheets and strip at \$4 to \$8 a ton off the published prices that had been in effect up to that time. While price concessions were prevalent on a good many steel products, open breaks in quotations did not occur to the extent that they did in sheets and strip, which was described in *THE IRON AGE* at that time as "The worst price chaos the steel industry has experienced in years."

Despite the fact that price concessions were common during the early part of the year, as was freely admitted by steel executives at the recent steel hearings before the Temporary National Economic Committee in Washington, no official change in published quotations occurred until the outbreak of widespread price cutting in May. Following this price break the mills attempted to stabilize the market by an outright reduction of the published prices on sheets and strip. These changes, however, were an advance over the prices that had actually been in effect.

On May 15 the Carnegie-Illinois Steel Corp. issued an announcement

which reduced the published prices on sheets and strip \$3 a ton, but the quantity differential of \$3 a ton which applied on lots of 75 tons or more of one size and grade for shipment to one destination was eliminated. Earlier in the year the minimum quantity to which this deduction applied had been lowered from 150 tons to 75 tons. Hot rolled carbon and alloy bars were also reduced \$2 a ton and quantity deductions were likewise eliminated. The American Steel & Wire Co. announced a \$3 a ton reduction on cold rolled strip and commodity strip in line with the reductions on other flat rolled products.

Within a week or two after the stabilization of prices the whole steel situation presented a better picture. By early June steel production, aided both by the settlement of the coal strike and by larger orders, had climbed to 53 per cent from a low of 45½ per cent in the middle of May. After the dip which usually occurs in early July, production continued to climb. Starting from 50 per cent the second week of July, it jumped 10 points within two weeks. By mid-August the rate had equaled the high point of 1938.

WHEN war broke out in Poland on Sept. 1, followed by declarations of war by Great Britain and

France, an overnight demand for steel in overwhelming proportions burst upon the steel industry, creating one of the most confusing situations the industry had ever experienced. Orders came in so rapidly during September and October that clerical forces could not cope with the flood and operating departments were in many instances unable to make specific delivery promises until a clear view could be obtained of what was expected of them.

Complicating the tangle of orders was a sudden buying movement by the railroads, which rushed into the market for large tonnages of rails, material for car repairs and for the building of new cars. Not until late October was the pressure on the mills lifted in the slightest degree. When the total volume of business that had been placed was finally determined, it was apparent that capacity or near-capacity operations would be essential to the end of the year to complete the rolling and shipping of an unprecedented volume.

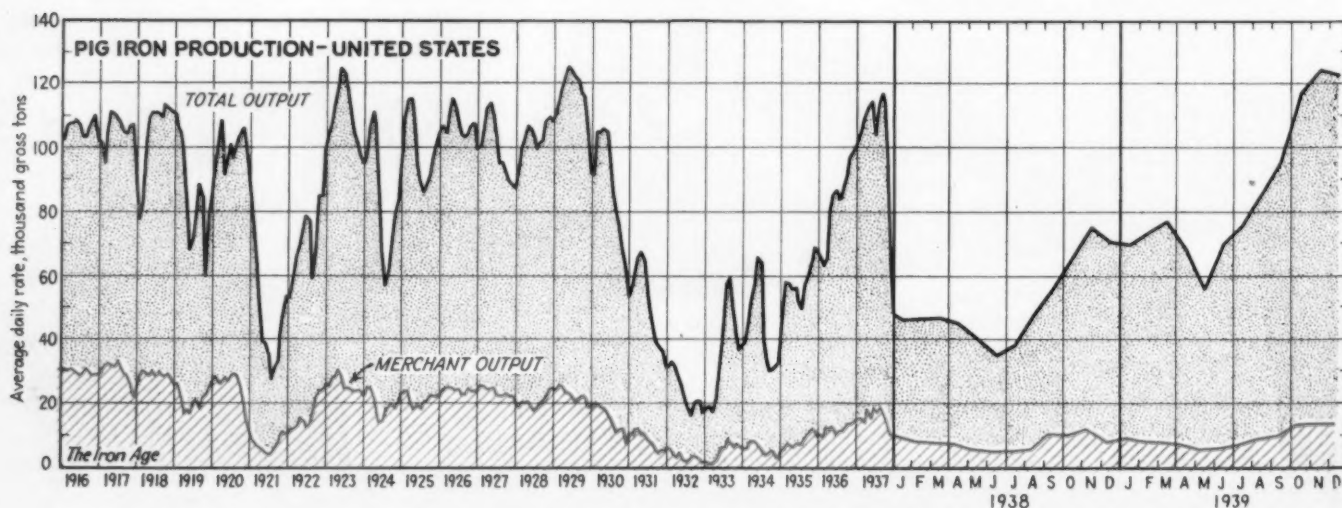
Looking back on the situation as it developed in September, it can be stated with certainty that nearly all steel users were actuated by the fear of higher prices caused by war conditions and steel shortages. Many companies had been operating on such small inventories that protective buying became an immediate necessity.

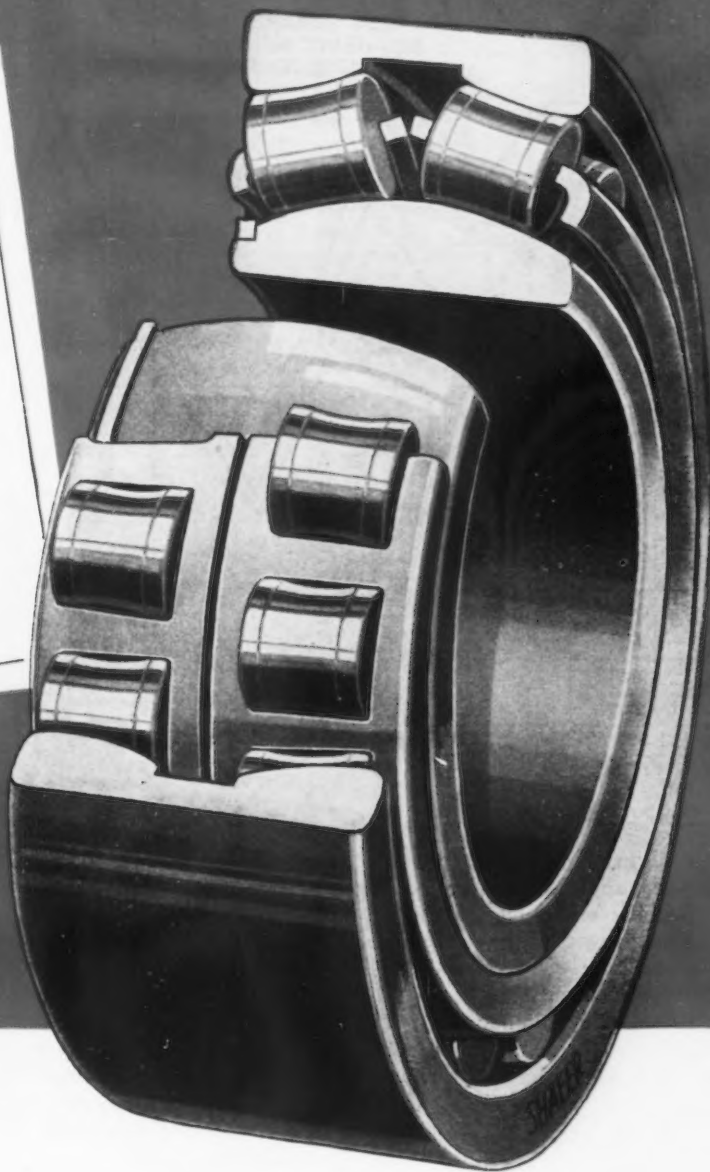
Concern Over Prices

In August, before there was any expectation that hostilities would come so soon, there was a definite feeling in the trade that moderate upward price adjustments would be made on some products. When war came the Washington Administration immediately exerted moral influence against price increases that would tend to

o o o

PIG iron production broke no record in the fourth quarter of 1939, as did steel production, but attained a high level.





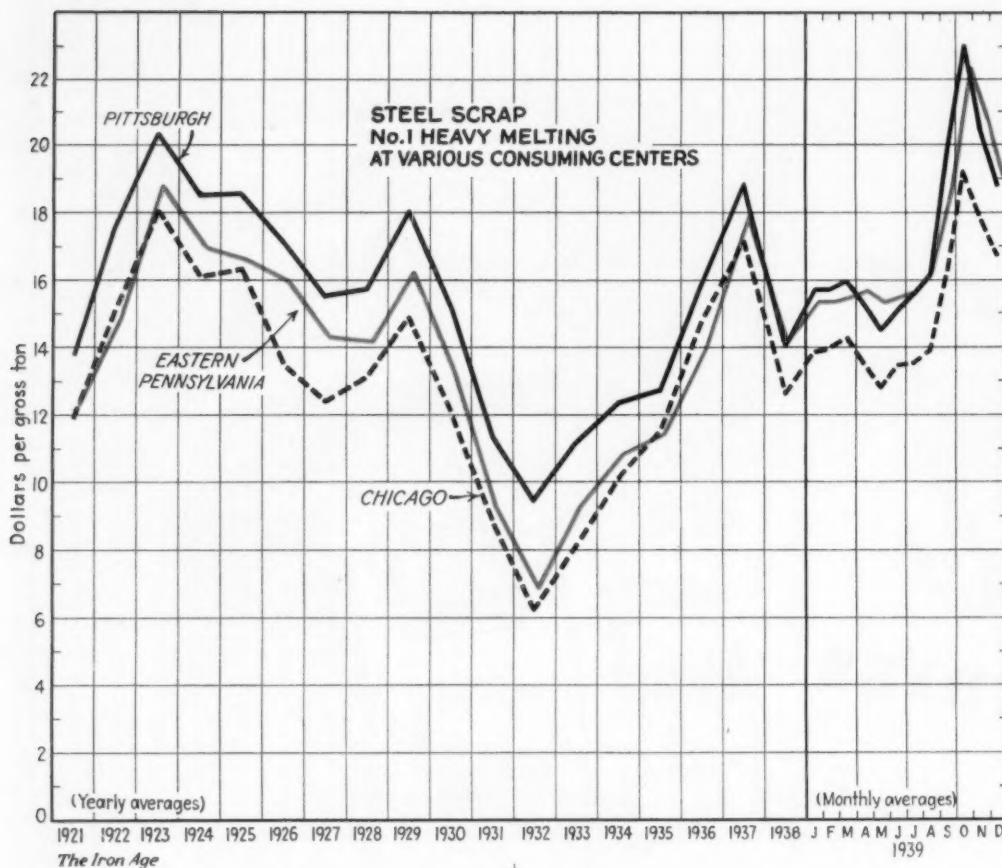
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A SHARP rise in steel scrap prices accompanied the record breaking increase in steel ingot output in September and October of the past year, but about half this increase was lost in the reaction that set in in November and December. The influence of exports was evident in the Eastern Pennsylvania price, which on several occasions rose above the Pittsburgh level. Highest monthly average quotation in 1939 on No. 1 steel at Pittsburgh was \$23.05 in October. This compares with the 1937 high of \$23.15 in March. Yearly average price at Pittsburgh in 1939 was \$17.17 as against \$18.68 for 1937.

create inflationary tendencies. Until more accurate appraisal could be made of the possible effect on production costs of rising raw material prices, the United States Steel Corp. subsidiaries withheld announcement of fourth quarter prices. The announcement of reaffirmation of existing quotations did not come until Sept. 15, a later date than usual.

Meanwhile prices of scrap, tin, zinc and other raw materials of the steel industry were headed upward, which pointed to the possibility that the steel companies would be forced in self-protection to raise their prices for the first quarter. But the Washington Administration, feeling perhaps that it had won a victory in keeping prices at an unchanged level, merely resumed its campaign with more vigor, using every available means, even to the extent of scarcely veiled threats of price control legislation, in an effort to forestall a price advance for the first quarter.

As the time approached for the usual announcement of first quarter prices, conditions had changed somewhat. A rapidly ascending scrap market had struck a peak sooner than expected and other upward price movements were halted. Moreover, calmer

appraisal of the situation had convinced some of the steel companies that reaffirmation of prices would "prevent inflationary tendencies" and "runaway price levels which have accompanied other periods of abnormal activity" to quote the statements of two companies that were made at that time. An upward price movement might also have been accompanied by labor agitation for higher wages.

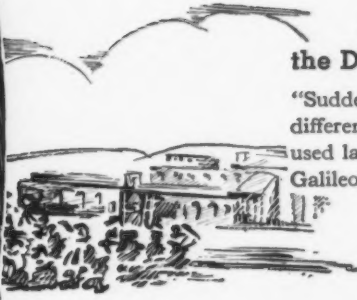
Therefore, the only price changes were in the nature of adjustments to meet certain competitive situations. Hot rolled sheets and strip were raised \$2 a ton, but on the lighter gages of sheets the advance was offset by reduction in extras of equal amount. Another adjustment was a change from a gross ton to a net ton basis in the selling of wire rods, which resulted in an advance of \$1.60 a net ton on the base sizes.

The decision of the steel industry to maintain a virtually unchanged and relatively low price level at a time of abnormal demand for its products marks a distinct departure from past performance. In the past it has been almost axiomatic that higher prices should accompany rising demand. The merchandising principle upon which the industry has operated was that the mere intimation of higher prices would

drive in a substantial amount of additional business. When everybody was well supplied, business fell off sharply, prices weakened, and the inevitable adjustment to a lower price level became at times a painful process. It has been proved in the past that price advances that are not strongly supported by favorable economic conditions can only result in an eventual price cutting situation which may carry prices below the level that existed prior to the advances. It may well be that the recent situation has brought about a more enlightened price policy for the industry that will eliminate some of the peaks and valleys in price levels, thereby contributing to the stabilized price situation that the steel industry has long contended is essential to many of its customers.

Thus the steel industry enters 1940 with a price structure which, considering the highest wages in history and other high costs, including taxes, is relatively lower than in other periods of good business. Comparing the present price structure with that of previous years (based on THE IRON AGE finished steel composite price) the present average is only \$7.64 a net ton over the 1933 average, which was the lowest since 1915. Compared with

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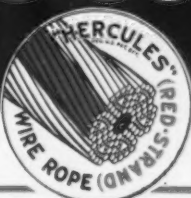
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the average for 1929, the best year the steel industry ever experienced, the present price structure is only \$1.04 a net ton higher, while it is \$4.06 below the 1937 average and \$2.66 below the 1938 average. Looking at it another way, the present finished steel composite price of 2.261c. a lb. (\$45.22 a net ton) is \$1.43 a net ton below the average of 20 post-war years (1919 to 1938, inclusive), which was \$46.65 a ton. That 20-year period takes in nine years in which the annual average was above the present level and 11 years in which it was below.

Scrap Prices Soared

ONE of the complicating factors of the sharp rise in steel orders and production in the period immediately following the outbreak of war was the equally rapid rise of scrap prices, which created a problem of costs that sorely troubled steel companies in their consideration of steel prices. Some of the Eastern plate mills and one in Ohio, caught in the maelstrom of quickly rising costs, advanced prices of plates and heavy hot rolled sheets \$5 a ton and obtained the higher level so long as the major producers were unable to make reasonably prompt deliveries.

From the first week of September until the peak was reached, THE IRON AGE steel scrap composite, an average of Pittsburgh, Chicago and Philadelphia quotations, advanced \$6.88, this occurring within one month. In this same period the Pittsburgh average price went up \$8, the Chicago average \$6.375 and the Philadelphia price \$6.25. After this upsurge of prices, the markets weakened and a considerable part of the advance was lost. The low point of THE IRON AGE scrap composite during the year was \$14.08 in mid-May when the coal strike was crippling steel and pig iron production; the high was \$22.50 the first week of October.

During the period of rapidly rising scrap prices there was much talk of a potential scrap shortage. There was renewed discussion among some of the steel companies of appealing to Congress again for restriction of scrap exports through a licensing system. At this juncture the United States Bureau of Mines decided to conduct a survey of consumption of scrap and stocks in the hands of consumers and dealers. The figures, which were announced in November, showed a situation as of the end of September that was not as alarming as it had been pictured. While no large surplus of scrap was revealed, neither was there

an indication that there would not be enough scrap to take care of essential requirements. It is true that scrap consumption during October, November and December has been at an abnormally high rate, but scrap production also has increased, particularly from such major supply sources as the railroads and the automobile industry,

while miscellaneous consumers of steel were also making scrap in larger quantities in their increased manufacturing operations. The Bureau of Mines will continue its scrap surveys bi-monthly, and the results should tend to stabilize scrap prices by removing some of the uncertainties that have existed regarding the potential supply.

Scrap Exports Expand

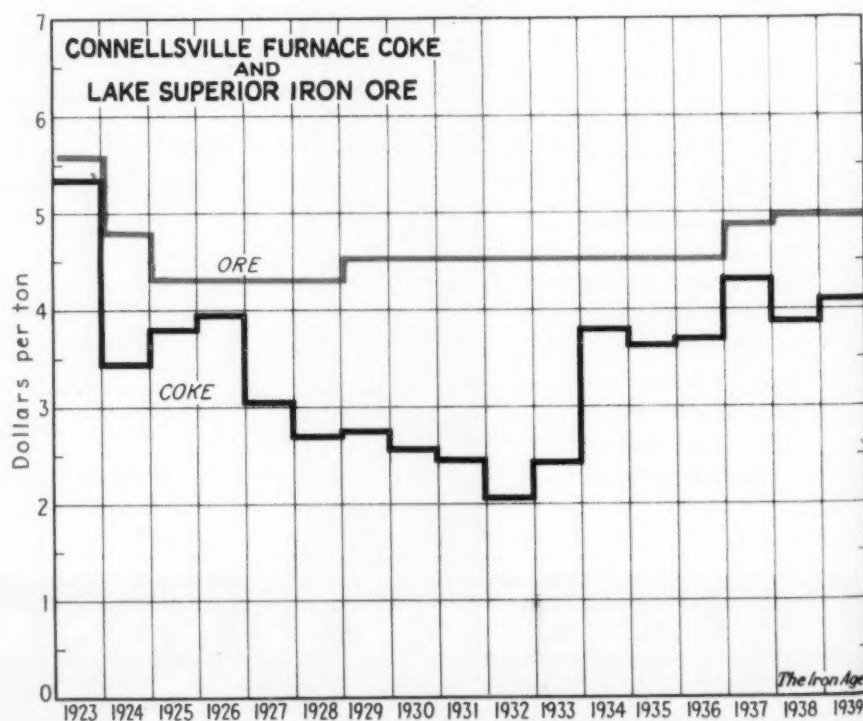
WAR demands developed an upsurge in 1939 purchases of American iron and steel scrap for export with indications the total for the year may have exceeded the previous peak of 4,039,143 gross tons shipped abroad in 1937. This estimate of a record-breaking movement last year is based on the particularly heavy British orders, together with the continued high volume of tonnages taken by countries which for the past few years have been large quantities of scrap from the United States. Japan, the United Kingdom, Italy, and Canada each showed greater purchases in the first 10 months of 1939 than for the corresponding period in 1938. Poland had taken larger tonnages in the first nine months of last year than in the 10-month pe-

riod of 1938. While Poland has been shut out of the market as the result of the German invasion, this loss of tonnage is small when measured against the greatly increased purchases by Great Britain, which in one single lump order in November purchased about 300,000 tons.

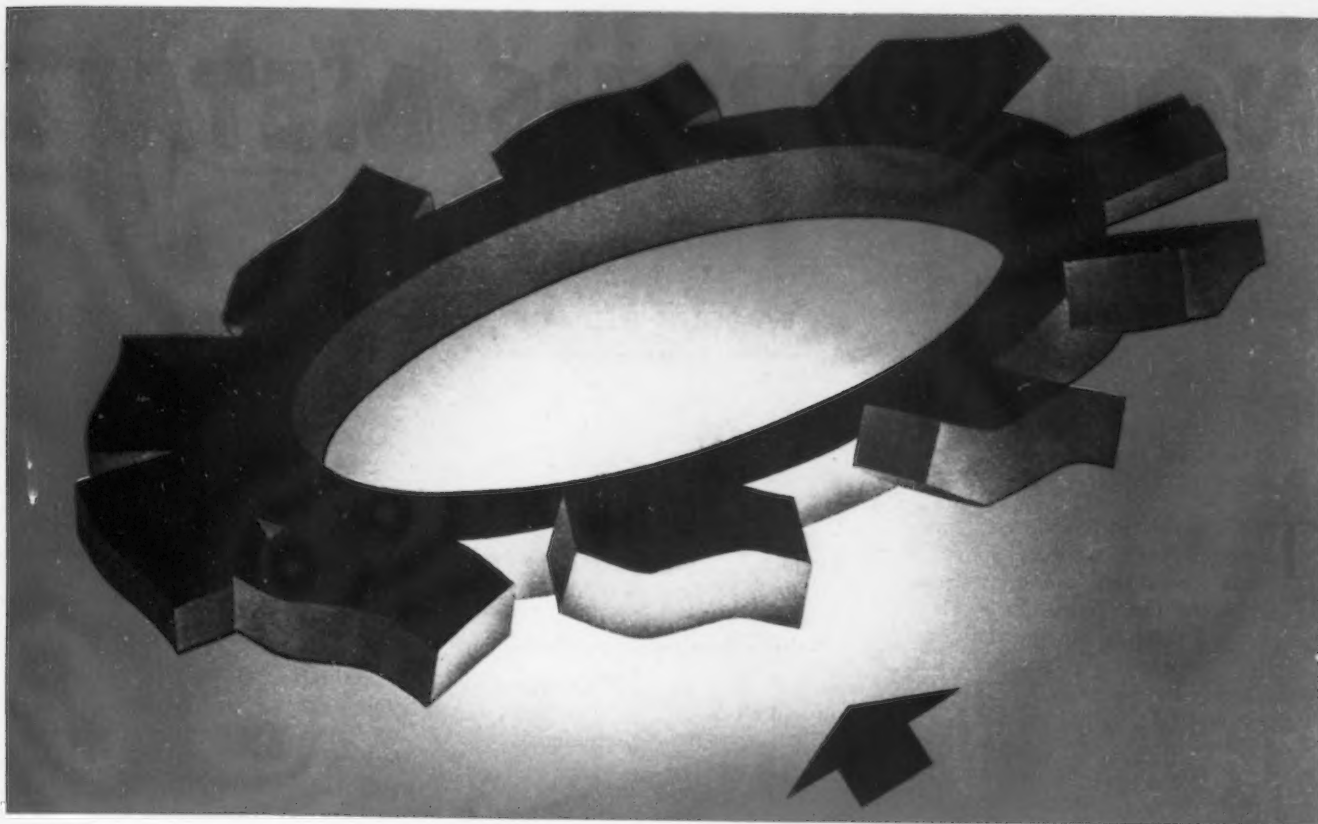
In the first 10 months of last year scrap exports totaled 3,098,367 tons, an increase of 696,574 tons over exports in the first 10 months of 1938 and of 23,992 tons over that entire year.

Imports of scrap in the first 10 months of last year were 27,388 tons, of which 25,845 tons came from Canada. Of the 12,548 tons imported in

(CONTINUED ON PAGE 147)



THERE was a slight bulge in prices of Connellsville coke in 1939, a development that in late years has occurred only in periods of heavy demand when by-product coke supply is insufficient.



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NON-FERROUS METALS

• • •
By ADOLPH BREGMAN
Consulting Engineer, New York
• • •

THE impact of the European war on the American metal industry has been sharp—not stunning as it was in the first World War when this nation was caught mentally as well as physically unprepared, but nevertheless hard enough to jar the country out of its traditional isolationist dream of security. Now, this country again faces the grim fact that in spite of 3000 miles of salt water to the East and 6000 miles to the West, there is no “safety.” No safety from either a military or industrial standpoint, because, like other nations, the country is not wholly self-sustaining.

Metals, for the purposes of this discussion, may be divided broadly into several classes: Essential, dispensable, available from American sources and imported. These classes could be further sub-divided, but for practical purposes, the classification laid down by the Army and Navy Munitions Board will serve: The strategic, the critical, and the neither strategic nor critical metals.

Strategic materials are those upon which we are dependent in whole or in part on sources outside of the continental limits of the United States. Critical materials are those whose procurement is, while difficult, less serious than those of strategic materials for one or more reasons. Materials neither strategic nor critical are those which, although just as essential as the others, present little or no problem in procurement. The Munitions Board's list of the industrial metals in these classes is given below:

Strategic

Aluminum	Nickel
Antimony	Quicksilver
Chromium	Tin
Manganese (ferro grade)	Tungsten

Critical

Cadmium	Titanium
Platinum	Vanadium

Neither Strategic Nor Critical

Copper	Molybdenum
Iron and steel	Zinc
Lead	Zirconium
Magnesium	

Other commercial metals include bismuth, cobalt, beryllium, calcium, columbium, indium, selenium, tellurium, tantalum. These are all of lesser industrial necessity, but nevertheless should not be omitted from a general review.

Aluminum

Aluminum has always been considered by the layman a peculiarly American metal. In 1938 there was more domestic production of metallic aluminum in ingots and shapes (130,100 tons) than in any other country except Germany (161,100). What is not so generally realized is that the mineral source of aluminum, bauxite, is to a considerable extent imported (455,693 tons in 1938 against 323,818 domestic output). The imported ore came from Dutch Guiana (386,756 tons), British Guiana (60,044), Greece (8400) and Netherlands Indies (493).

For that reason, aluminum is placed among the strategic materials. The situation is not dangerous, however, as most of the imports come from South America, from friendly powers, and as a consequence, being far from the main war arena, are likely to continue to arrive at a good rate.

Aluminum is strategic but not unsafe. Moreover, a recent announcement by the Aluminum Co. of America that there will be no advance in do-

mestic prices for aluminum ingot during the first quarter of 1940, is decidedly reassuring.

Antimony

Antimony has suffered for some time. Coming mainly from China, it has been severely affected by the “undeclared” war raging in that country with the inevitable results of fluctuating exports and fluctuating prices. China's contribution to American imports of that metal was 70 per cent in 1929, but it has since given way to Mexico, which in recent years has supplied 60 per cent of the imports, mostly in the form of ore.

Previous to 1914 practically no antimony was produced or smelted in the United States, although a minor portion of domestic needs came from the antimonial-lead output of lead smelters. With the first World War American output rose and then declined again after its close. In recent years, however, the antimony industry has been stimulated again with the result that production has risen from 1204 tons in 1933 to 4057 tons in 1937. To this supply of new metal must be added the secondary antimony in the form of antimonial lead which equals about two-thirds of the supply of new antimony used in this country.

Nevertheless, the total domestic production possible would fall far short of war needs. Our anchor to windward lies in the fact that ores for American production are being obtained in growing tonnages from Mexico and Bolivia and if the need arose, American refinery production might be stepped up. It remains, however, a decidedly strategic metal and one which is subject to sharp fluctuations in price. Leading

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industrial users are storage battery and bearing metals manufacturers.

Chromium

Chromium consumption is divided into three classes: Metallurgical, refractory and chemical. The ore, chromite, supplies the raw material for all of these uses. It is obtained almost wholly from abroad; 352,085 tons imported in 1938 against 812 tons shipped by domestic mines. Of these imports, Africa (southern Rhodesia and South Africa) supplied 48 per cent, Cuba 11 per cent, New Caledonia, 8 per cent, Turkey 6 per cent, Greece 3 per cent and the Philippines 22 per cent. Consequently it is among the four mineral commodities which have priority for stock-pile reserves for the War Department. To industry its importance may be judged from the fact that steel uses three-quarters of the total domestic consumption.

Although the main sources are in friendly hands, shipments are subject to long sea voyages, and consequently in some danger of interruption. Prices are likely to be higher in the face of less certain supplies and the heightened war demand.

Manganese

Manganese is one of the most difficult problems on the list. This country is unable to produce enough for even one-tenth of its requirements. Although it is known to exist in a large number of localities, the deposits are so small and widely scattered that economical mining and extraction have so far been considered impractical. At this time, the only hope for even partial American independence lies in a few large low grade deposits. To date, however, there is no proved process for economical extraction from these ores and so much work still remains to be done that immediate help is hardly to be expected. The only noteworthy producers in this hemisphere, Cuba and Brazil, are rapidly gaining ground and offer growing sources, but their output is still comparatively low.

The country's imports in 1938 consisted of ores containing 80,673 tons of manganese metal from Russia, 63,890 tons from the Gold Coast, and 13,121 tons from British India; all obviously difficult sources in times of war. The total imports in 1938 amounted to 234,169 tons of contained manganese in 483,588 tons of ore. Cuba sent 61,535 tons of contained metal and Brazil 13,307 tons and these countries will be looked to for immediate help. Domestic output in 1938 amounted to 25,321 tons of ore containing over 35 per cent manganese.

Manganese is not only a strategic metal but also dangerously unreliable.

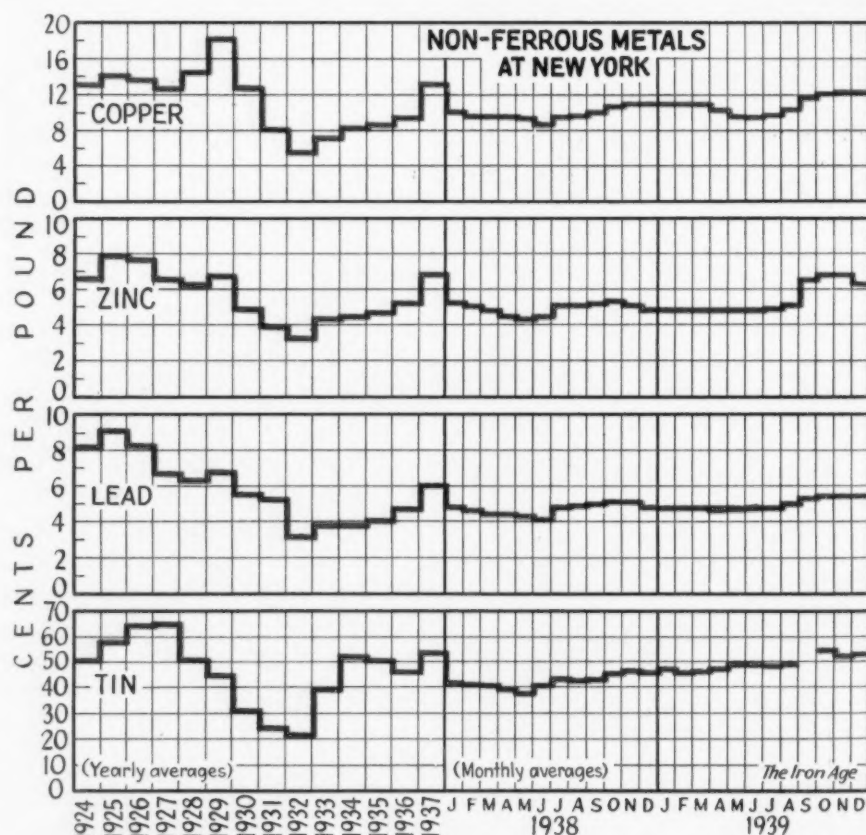
Nickel

Nickel has long been one of the most vital constituents of war materials. During the last 20 years, however, it

has become equally well known as a necessary element in the peace-time industrial fabric. Nature made it a "monopoly" metal, depositing most of it in Canada, although small contributions are made from a dozen other localities. The quantity produced throughout the world in 1938 has been estimated at about 120,000 tons, of which Canada was responsible for 105,337 tons. America is the largest consumer, having taken about 25,000 tons in 1938, and at the same time, is an almost complete non-producer. So, for this indispensable metal the country is completely dependent upon the British Empire.

Nickel is unquestionably strategic but not dangerous, and the large number of industries which depend upon nickel both as a primary element and

(CONTINUED ON PAGE 149)





When Cannon Grow Cold

... war-skilled fingers will loosen their grip and reach hungrily for the instruments of peace. Weary men will catch their breath and think of production for consumption, not destruction. They will take their place beside marvelously improved machines which will help create a greater abundance of goods so necessary to the comfort, convenience and happiness of millions. The Monarch Machine Tool Company, Sidney, Ohio, U. S. A.

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FOLLOWING a half year of comparatively indifferent production, steel-making activities of major nations jumped to capacity figures during the last quarter of 1939, as war changed from a possibility to a grim reality. By the year's end the world was turning out steel at a pace never before equaled in history, far too great a proportion of it being funneled into destructive outlets for the world's own good.

Pig iron output for 1939 established a new record level, at 104,494,000 gross tons. However, there was a lag in steel ingot output, the year's total being 131,277,000 tons, about 2,000,000 tons under the all-time peak in ingot production established in 1937.

Of the 131,277,000 tons of ingots turned out by the world last year, the United States as usual accounted for the greatest proportion, 35 per cent. Germany, under a terrific nationalistic drive, accounted for almost 19 per cent; Russia was next at about 13 per cent, the United Kingdom 10 per cent, France 6 per cent, and Japan 5 per cent.

The background of the year's activities in the United States is discussed in detail in several other stories in this Annual Review issue.

For England, the entire year was an active period in iron and steel, although with the declaration of war the last possible pound of capacity was placed into production. At the outbreak of the war, the iron and steel industry, through its governing body, the British Iron and Steel Institute, mobilized for service to the state by putting strict controls in operation, both as to delivery of material and as to prices. At the moment there is a large piling up and accumulation of orders at the various mills which is causing some embarrassment, but the industry in England is looking forward to some relief from pressure and alteration in some phases of the control, all of which may ameliorate the situation somewhat. This may be a vain hope, however, and it is even more likely that the year 1940 will witness, if the war continues, a sharp rise in importations, first from within the Empire and later probably from the United States and other countries such as Belgium.

So intent have British steel makers become with war problems that little attention is being paid to the new (and only) continuous sheet mill at Ebbw Vale. This unit is now in production, but like all other steel rolling capacity is under strict control as regards output and raw material sup-



ply. When plans for construction were announced by Sir William J. Firth, the proposal met with bitter opposition, which was a reflection of fear regarding the introduction of a new process into an industry with an age-long reputation built up by methods now largely out of date, and by widely scattered firms with small financial resources. There developed the direst of apprehension as to how such a continuous mill, with its enormous capacity, could be fitted into the economy of the steel industry without causing an upheaval leading inevitably to widespread disorganization and hardship. However, the price control exercised by the Government has prevented this new mill from being exploited to the full, and perhaps by the war's end the problem will have assumed less desperate characteristics than it has over the past several years.

U.S.S.R. Has New Record

With the First and Second Five-Year Plans for industrialization under their belts, the Russians in 1939 chalked up a new record in pig iron output, that is, 15,374,000 tons. For the same year ingot output is estimated at 17,440,000 tons, slightly under the record of 17,802,000 tons established in 1938. However reports for recent months have been so sketchy that it is possible that 1939

showed a new high for ingot production also.

According to the Bureau of Research on Russian Economic Conditions, Birmingham (England) University, the increase in Russian steel production has taken place in all regions. The new steel making center in the Kuznetsk Basin of Siberia is turning out large quantities of metal now, but in spite of the large increases in production noted in other centers of the industry (South Urals) their relative share of production has fallen. On the other hand, in the old industrial center (the Central region of the R.S.F.S.R.) heavy metallurgical production has increased to a far greater extent than in the entire U.S.S.R.

What data there are available also show that the consumption of steel in Siberia is increasing not only absolutely but also relatively. This has been especially true in the Urals, where an industrial base, second only in importance to the South, is being constructed. The consumption of metals in North European Russia (chiefly in the Leningrad district) is falling relatively, this tendency being welcomed because the finishing industries of the Leningrad area use raw materials imported from a distance. The consumption of metals in the Central areas



has risen much less than elsewhere, which also is fortunate in view of the relative overcrowding of this region with industrial enterprises and its poor metallurgical resources. The chief producing and consuming region for steel remains as formerly, namely the South.

There is still not a proper distribution of labor between the Southern and Eastern steel industry, and there is also great confusion in the location of the metal supply. For example, the Novo-Kramatorsky machine building factory situated in the Donetz Basin, obtained its raw iron in 1938 from Magnitogorsk in the Urals. The Ural railroad car building factory in Nizhny Tahlil only got 40 per cent of its metal from the Eastern factories and the remainder from the Southern and Central areas. The electrical machine building factories are chiefly in Moscow, Leningrad and Kharhov, but iron and steel for electrical equipment is supplied by the Verchne-Isetssky factory, about 1200 miles away. Thus, in spite of the improvements in the location of the coal and steel making industries, production (of finished material) during the past year has not fully responded to the increased capacity and new territorial consumption.

On the whole, during the First and Second Five-Year Plan periods, geographical changes favorable from the

national economic standpoint took place in the location of the production of coal, steel, machine building, electric power and certain branches of other industries. The changes effected in the geographical location of industrial production are directly reflected in the enormous changes in the town populations of the U.S.S.R. between 1926 and 1939. It appears, however, that the changes in the location and consumption did not, however, proceed harmoniously. As a result, the average haulage for coal, steel, oil, iron ore, cement and other freight has not decreased as anticipated, but has actually risen during the First and Second Five-Year Plan periods. The intention is to have these geographical disparities removed by the Third Five-Year Plan period now in operation.

The Third Five-Year Plan is considered more moderate, practical, and related to real possibilities and requirements than the two previous Plans. It is based on the principle of comprehensive economic development of the individual regions, in particular of the Eastern and Far Eastern regions, and aims to rectify the present uneven state of development. The Third Plan calls for 52 per cent increase in pig iron production, 58 per cent in steel ingot output, 99 per cent in rolled steel, and 90 per cent in coal. If these advances are achieved, according to

Soviet claims, there may be years when U.S.S.R. output of steel will surpass that of the United States.

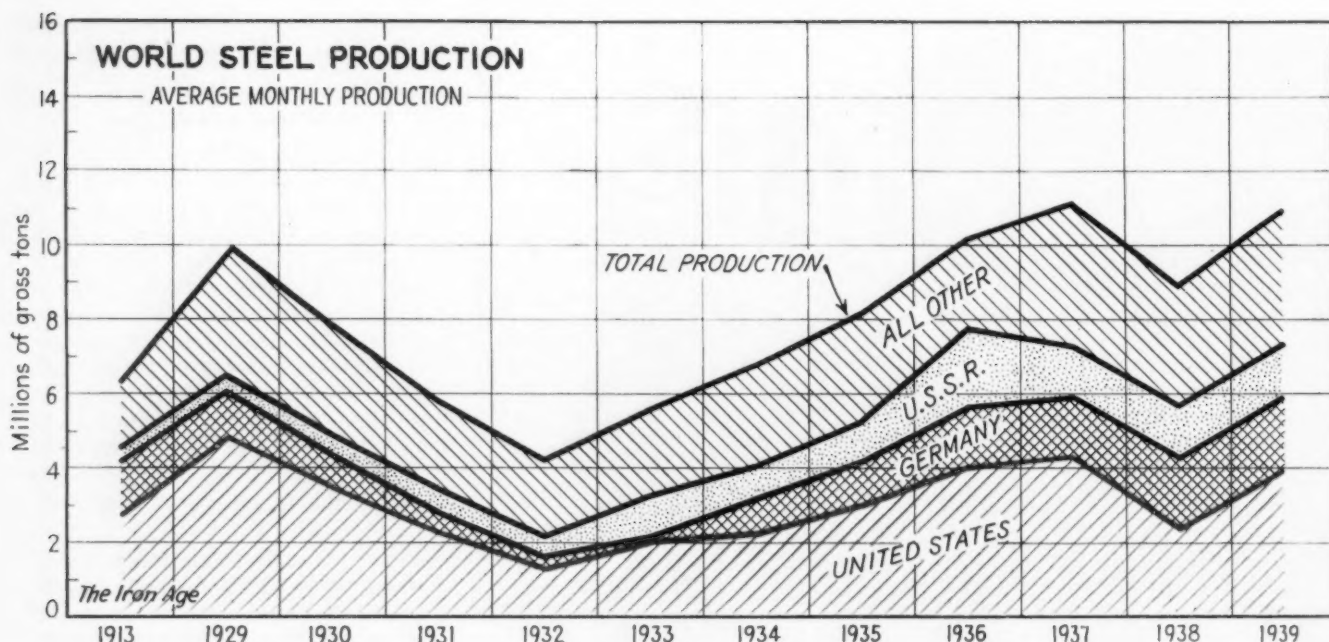
France and Belgium

French production of both pig iron and ingots in 1939 was considerably above that of the previous year, but did not reach the peak level established a number of years ago. The industry now is of course working to capacity on armament orders and is devoting but little attention to civil requirements. The conditions ruling in a free market have been superseded by control in all branches, both of materials and prices, and in spite of the novelty of a strict control of the movement of materials, the various plants appear to be receiving all the tonnage they require. Prices are a stumbling block to a certain degree, owing to their obscurity. All wages and salaries have been brought under Government control and changes in the future will only be permitted with the prior approval of the Ministry of Labor in the national interest.

A number of new electric furnaces have been erected in France to meet the demand for armament steel, and are as follows: one of 20 tons at Firminy, two of 2 and 5 tons at Unieux, one of 2 tons at Chambon-Feugerolles, and one each of 20 tons at Ancizes, Montlucon, Paniens, and Boucau. The construction of the new furnaces was undertaken in each case with the help of the Government.

In Belgium the steel making pace has now fully recovered from the inertia that struck it when war was declared and there was interference with raw material supply. Even now there is some hesitation on the part of some foreign buyers to place orders with Belgian producers in view of the possibility of the country being invaded. None-the-less, the volume of orders forthcoming from all directions much exceeds the potential supply and there is every likelihood of Belgium running near capacity for many months in the future. Recently the principal demands have come from various neutral European countries, that is, Holland, Scandinavia and Portugal. Contact has also again been established with various buyers in the Far East and South America, but owing to shipping difficulties no firm orders have yet materialized. Trade with England is considered satisfactory and an expansion is expected.

The raw material question in Belgium is naturally in the forefront of interest, since France has always been the principal supplier of iron ore. In the past, France has furnished 9-



WORLD production of steel in 1939 was intensified as Europe taxed capacity to feed her war machines, but the year's output did not quite reach the record level of 1937.

000,000 tons of ore to Belgium, corresponding to about nine-tenths of the total consumption of the Belgian works. Following negotiations with the French authorities, trainloads of ore continue to be sent to Belgium, and are arriving fairly regularly, but the situation is still far from normal.

German Position Questionable

With a pig iron output of 20,000,000 tons and ingot output of 24,500,000 tons, Germany established a record level of production in 1939. The rec-

ord is an uneasy one, though, and the situation in the Reich is far from being as satisfactory as the peak production and the acquisition of steel plants by conquest would indicate.

Germany's steel-making plant has for the past two or three years been operating at such a high load that it is certainly problematical whether it can continue to be driven to the limit of capacity without a great deal of overhauling and reconditioning of equipment. And certainly the time is not ripe now for such action.

As regards acquisition of steel plants by conquest, a quick glance would indicate a most fortunate result. A second glance indicates otherwise. First, there came those parts of Czechoslovakia in March which Chamberlain did not give away the previous year at Munich. Of this group of steel plants, the important works of the Trans-Olzan was lost to Poland because she jumped in faster. In any case, Germany picked up from Czechoslovakia (Bohemia, Moravia and Slovakia) this year about 1,500,000 tons of pig iron and 2,000,000 tons of ingot capacity. But there is a rub. The Czechs had developed iron ore properties at home, but at least one-half the industry's requirements had to be imported from Sweden and the Soviet Union. Thus, the Czech plants seem to be a liability to Germany's metallurgical economy and certainly serve to accentuate her raw material difficulties.

On occupying Poland in September Germany hooked the Trans-Olzan works that Poland had previously hooked from the Czechs, and in addition got some attractive plants in nearby Silesia. The whole lot added up to about 1,145,000 tons of ingot and 880,000 tons of pig iron capacity. Here again the raw material question entered. Poland had made an attempt to develop indigenous iron ore resources but still almost 660,000 tons of ore and 500,000 tons of scrap were imported in the previous year.

(CONTINUED ON PAGE 153)

WORLD PRODUCTION (1937-1939)

(In Thousands of Gross Tons)

	Pig Iron ¹			Steel Ingots and Castings		
	1939	1938	1937	1939	1938	1937
United States	35,515	19,161	37,127	46,150	28,349	50,569
Germany ²	20,150*	18,227	16,026	24,540*	22,874	20,161
U.S.S.R.	15,374*	14,479	14,231	17,440	17,802*	17,497
United Kingdom	8,130	6,761	8,497	13,559*	10,394	12,964
France ³	7,826	5,956	7,792	8,402	6,079	7,779
Belgium	2,839	2,426	3,782	2,857	2,249	3,808
Japan ⁴	3,320*	3,100	2,900	6,230*	5,860	5,719
Luxemburg	1,812	1,526	2,473	1,650	1,415	2,471
Czechoslovakia	277	1,214	1,649*	392	1,733	2,281*
Canada	747	758	979	1,390	1,128	1,352
Italy	950*	849	843	2,337*	2,286	2,054
Poland	810	953	713	1,201	1,522	1,420
Sweden	612	647	636	1,080	964	1,113
Spain	403	427	190	479	415	210
All other countries ⁵	3,230	3,180	3,350	3,570	3,200	3,900
TOTAL	104,494*	79,664	101,188	131,277	106,270	133,298*

¹—Includes charcoal iron and ferroalloys. ²—Includes Saar district, Austria, Czechoslovakia since March, 1939, and Poland since September, 1939. ³—Includes Alsace-Lorraine. ⁴—Includes Korea and Manchuria. ⁵—India, Australia and South Africa account for a good portion of the totals. *Highest yearly production.

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MARS and MACHINE TOOLS

By FRANK J. OLIVER

Associate Editor, The Iron Age

WARS and preparation for wars have built up the greatest export market for metal working machinery that the industry has ever faced—greater than the demand created by the World War which reached a peak in 1917 when the Allies came trooping into this market for machine tools of all sorts. The growth of exports has been gathering like a snowball since the early depression years, although for specific countries, like Russia, the volume has ebbed and flowed with the course of power politics. In this review, the various foreign markets are analyzed, and the effect of recent accelerated buying is appraised in terms of the productive capacity of the industry and our own preparedness program.

AS FAR as the leading producers are concerned, it is not an exaggeration to say that at the start of the year, the export capacity of the machine tool and allied metal working machinery industry is sold out for the whole of 1940. For on top of an export market that had been expanding in almost geometric proportions during the last six years, last fall there came a deluge of long-term commitments, particularly from the French and the Japanese, that has practically absorbed the allocated capacity for export business for a year or more ahead. Whatever new business is placed in the early months of this year will probably go to the marginal producers, to plants especially organized to meet foreign needs, like shell-turning lathes, and to re-

built and used machinery sellers. Deliveries on new machinery for export have been quoted up to two years, but there is a reluctance on the part of most countries to buy so far ahead, what with world events occurring in such rapid succession. After the orgy of buying that has taken place, the market is going to look pretty flat for a time while factories operate at full capacity to reduce their backlogs.

With the declaration of hostilities in early September, the machine tool industry found itself overnight in a sellers' market for the first time since 1929. Domestically, the situation was touched off by tremendous buying programs for aircraft production, stimulated by French and British aircraft purchases, and also machinery pur-

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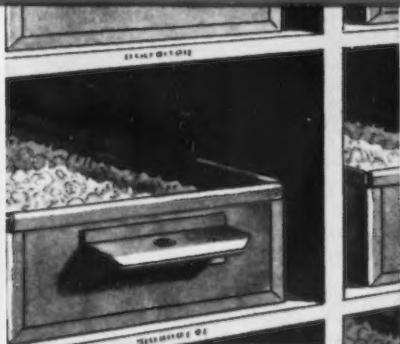
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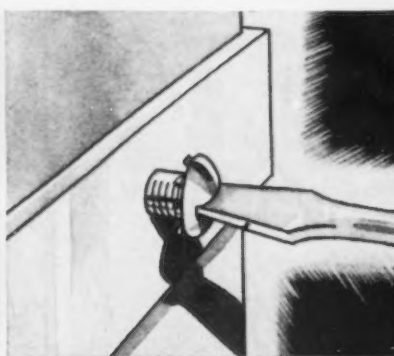
4—Perfect for fastening hard-
to-reach parts



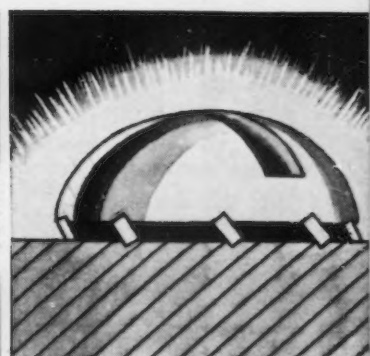
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chases by companies participating in U. S. Government contracts. Deliveries began to be extended and foreign buyers were quick to anticipate events by getting their orders on the books of the machine tool builders for 1940. The situation was brought to a head by the arrival of the French Purchasing Commission in New York in late September. To avoid delay, representative machine tool firms were called in and inquiries were issued in the most informal way. Once the French decided what they wanted to buy, there were only two questions asked—price and time of delivery, or generally how many machines per month beginning with a certain date. They then placed orders in large groups—100 to 125 machines in a single order.

To get some idea of the extent of

the French buying, it is necessary to go back a few years. From 1934 to 1936, inclusive, shipments of metal-working machinery to France averaged around \$2,000,000 a year. This figure was doubled in 1937 and then increased by 25 per cent in 1938, but it was still under \$5,000,000.

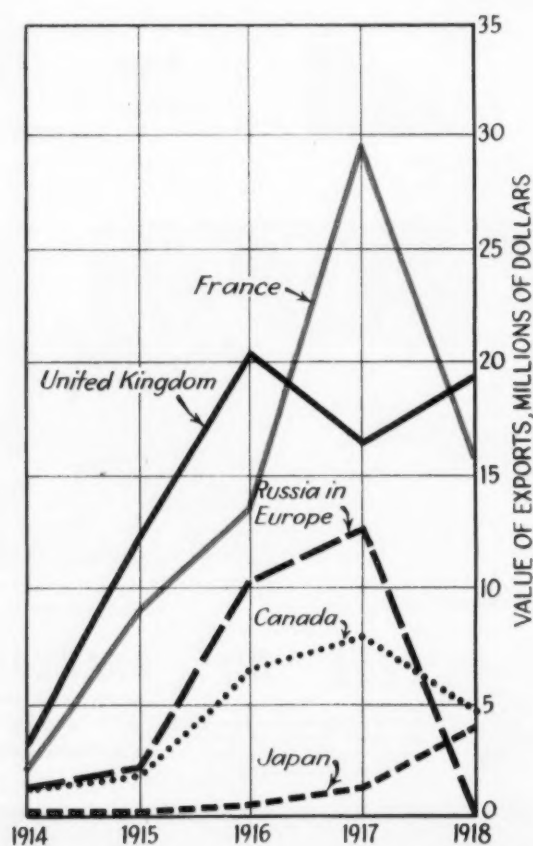
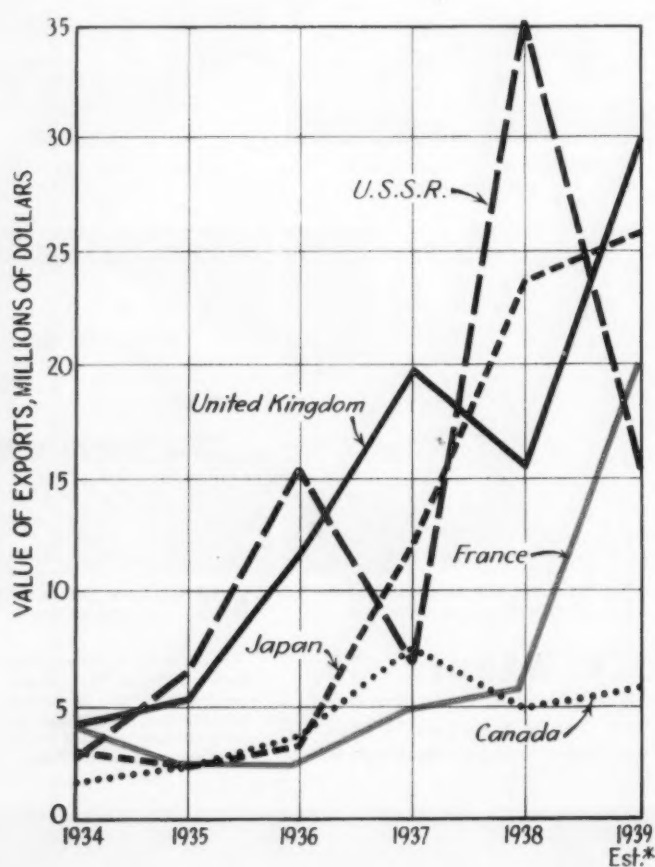
The jump in orders in 1937 followed the collapse of the Blum Government and of the so-called Popular Front party in France, plus the realization of the growing threat of the Hitler regime. Aircraft production had been allowed to fall seriously behind that of Germany. In an effort to modernize facilities, many American-made machine tools were bought in 1937 for the production of aircraft engines. The second spurt in machine tool buying was reflected in the steady rise in shipments the first five months of

last year, following the signing of the Munich pact in September, 1938, and the march of Hitler into what was left of Czechoslovakia in March, 1939. Aircraft production was further increased, as well as that of other implements of war.

In 1939, France imported as many American machine tools as the total of the previous five years—an estimated \$20,000,000 worth. In the space of less than two months, last fall, however, the French placed orders estimated at a total of \$40,000,000 worth of metal-working machinery. These heavy purchases will be reflected in shipments in 1940, particularly after March 1. This figure represents about 20 per cent of the productive capacity of the machine tool industry in 1937, a good year. If this amount of equipment is spread out in shipments over the pe-

UNITED STATES exports of metal working machinery to the principal consumers in the last six years and in the World War years of 1914-18. The classification of power driven metal working machinery includes all types of machine tools, presses and other sheet and plate forming machines, forge shop and foundry machines, portable power driven tools, chucks and cutters. Strictly machine tools account for 75 to 80 per cent of the whole.

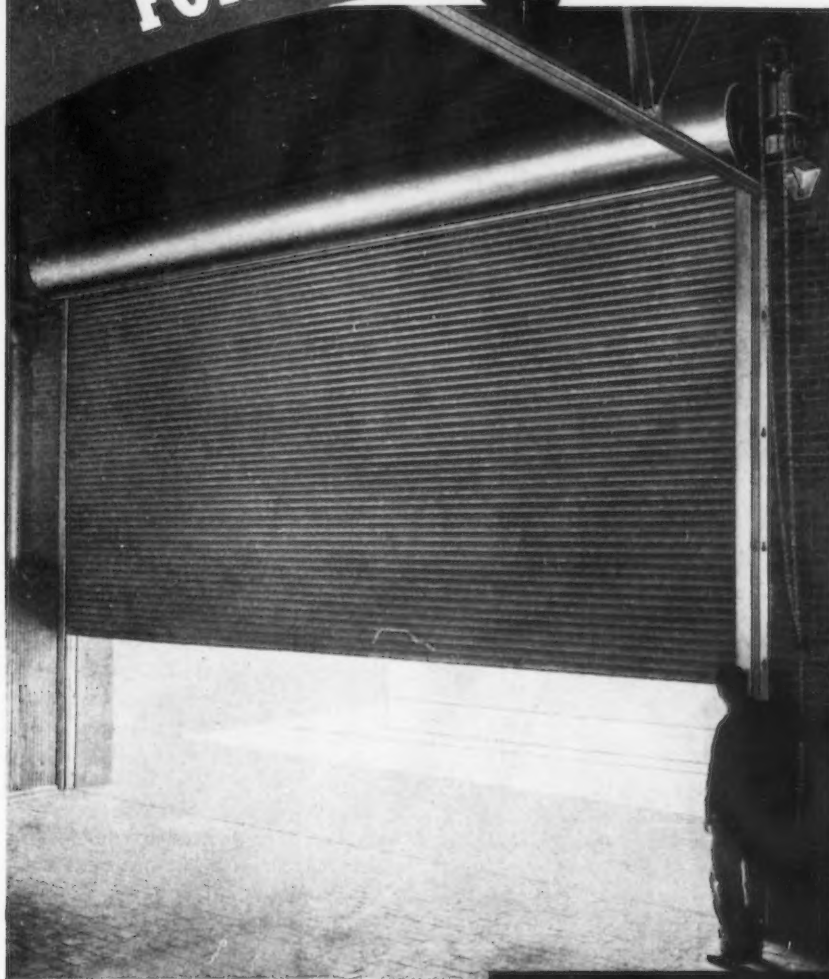
Source of data: U. S. Department of Commerce.



*Estimated on the basis of nine-month totals for 1939 and trend of shipments.

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riod of a year, average monthly shipments in 1940 will be close to \$3,300,000 or better, greater on a monthly basis than the best year's shipments since the World War. At that time, the peak was reached in 1917, when France imported \$29,254,000 worth of metal working machines from the United States.

The French are said to have inquired for as many as 3500 milling machines, 3100 engine lathes, 1200 turret lathes, and 1200 drilling machines, to mention a few. These figures compare with total productive output of 5061 milling machines, 8075

mission now in New York. To get a machine tool of any kind from the United States, a French manufacturer must place his request through this buying group. Hence the buying that was done in such a brief space of time last fall probably represents the sum total of all machine tools to be shipped to France this year. The bulk of these shipments will not begin until about March 1, but it is understood none will extend into 1941.

French contracts provide for payment of 25 per cent cash with order, full amount for any special equipment, including tooling, and the remainder

United Kingdom have totaled close to \$80,000,000, or more than double the exports to France in a like period, half of which were taken out in the last year. During those five years the United Kingdom built up an enormous capacity to produce airplanes, guns, shells, battle cruisers and other materials of war. So much so, in fact, that Canada had by the end of last year received few orders from Great Britain for production of war material. Perhaps this explains, also, why imports of machine tools into Canada last year were only slightly higher than in 1938 and not as great as in 1937.

Great Britain has been buying production machinery from other countries, too, principally Germany, which is said to have been supplying until recently a large part of shell-turning lathes, much more special purpose in character than anything produced in this country.

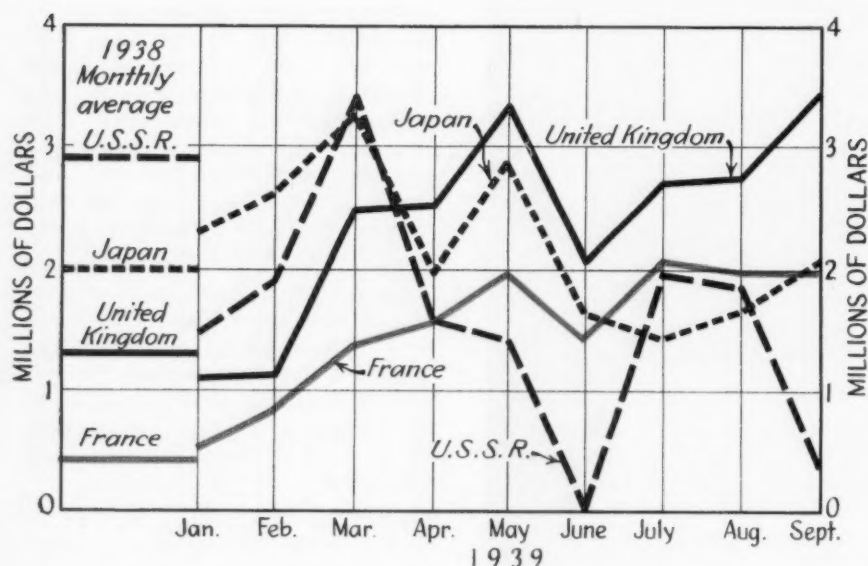
In connection with the British buying program, it is interesting to note that on Oct. 23, 1939, the British Board of Trade issued an order prohibiting the importation of machinery and plant except under license. Officially, licensing of imports was made not to reduce imports of machinery, but to see that only that equipment "necessary for the war effort and not procurable locally" was imported.

That machine tools are not to be excluded is evidenced by the fact that since that time the names of about 50 American manufacturers of metal working machinery who have been represented by agents in England for a good many years were almost immediately put on an approved list, in effect giving these firms a *carte blanche* license to import any such equipment desired by British manufacturers. Other machine tool imports must be licensed individually.

This situation perhaps explains why a great deal of the British buying is still being handled through regular channels abroad and why only a limited amount of purchasing of metal working machinery has been handled through the British Purchasing Commission in New York, at least up until now.

Both the British and the French have been primarily interested in purchasing American machine tools for the production of aircraft engines or of armament for aircraft, including machine guns, bombs and bomb racks. In fact, machine tool purchases by all foreign government missions in the United States have been characterized

(CONTINUED ON PAGE 155)



MONTHLY exports of power driven metal working machinery from the United States to the principal consumers during the first nine months of 1939. As a basis for comparison, the 1938 monthly averages are also shown.

Source: U. S. Department of Commerce.

lathes, 3138 turret lathes and 2800 drilling machines (excluding radial drills and sensitive drills) for the American machine tool industry in 1937, last census year. They compare with total exports in 1937 of 4612 engine lathes, 1230 turret lathes, 2008 milling machines and 3733 drilling machines (all types).

Since the opening of hostilities, every action in France has been toward increasing the war effort. Practically all metal working plants are devoting some or all of their capacity to producing aircraft, munitions, tanks, trucks, etc. Since the gold reserve is being carefully watched and all imports accordingly restricted, the machine tool requirements of all such plants were pooled and placed in the hands of the French Purchasing Com-

upon receipt of inland bill of lading. About 40 per cent of the equipment purchased is special purpose in character. The original contracts had penalty clauses for delays in shipment beyond the contract date, but most American manufacturers of machine tools struck this section out. There is also provision for the payment of partially completed work, should the contracts be cancelled.

British Buying

That shipments of metal working machinery to Great Britain this year will not equal those to the French seems certain. British purchases of American machine tools have been much heavier for a number of years. Over the last five years, purchases of metal working equipment by the

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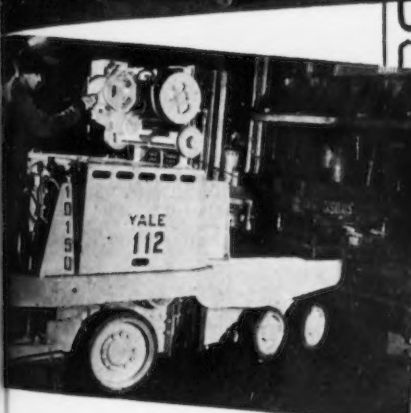
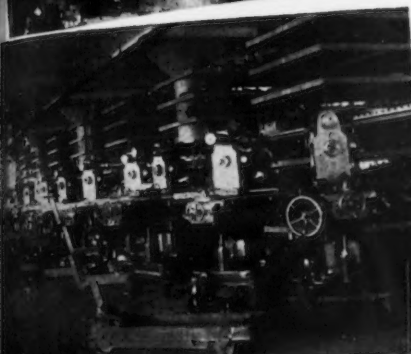
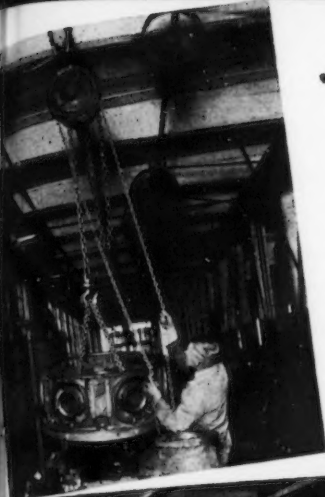
Materials handling is one production factor that must always be marked off as a loss. But how much—or how little—can be determined only by the efficiency of the equipment in use.

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Depressions...

CHALLENGE MANAGEMENT

RECENTLY many of our leading economists have predicted that one of the two following situations would occur:

1. The present industrial boom will crack up with a bang after the turn of the year because it is based *entirely* on inventory accumulation.

2. The boom will be followed by a moderate set-back rather than a crack-up as it represents *some* inventory accumulation.

It seems that we, as a nation, have had considerable experience and many examples in the past of booms and depressions; particularly with depressions in the last nine years; enough, in fact, to let us arrive at some sort of a solution. After all, like all difficult problems to be solved, the first principle is to reduce the problem to its simplest form. Then one can find a solution and adjust it to suit any complicated condition.

Therefore, in order to find a solution, it might be advisable to go back to fundamentals. To the days when each individual was practically self-sustaining, and start the solution from that point. After which we could determine where we may have forsaken the practical path.

In the days when each family was practically self-sustaining, they had only what they produced. If they wanted a home, they built the size of home they wanted—one, two, or three rooms and whatever other conven-

iences they desired. If a person wanted a suit of clothes, he or his wife spun the cloth and made the suit. He had as good a food supply as he produced himself.

Today, We Use a Reservoir

Today, this condition still exists except that each individual is a contributor to a vast system of supply. Our homes, clothes, food and other conveniences are much better, more plentiful, because we have provided better means of producing and supplying them. The value of these products is still practically all labor cost. As a matter of fact, the value of any product is practically all labor and labor only.

As an example, the iron ore from which all steel products are made is of no value in the ore field. It becomes valuable only as labor is spent to mine it and fabricate it into the finished product. The same may be said of a loaf of bread. Its value is the labor to sow the wheat, harvest it, transport it to the mill, and finally convert it into a loaf of bread.

Therefore, it can readily be understood that as labor costs are increased, the selling price must be increased unless provision is made to offset these increased costs by more efficient methods. If the selling price is high, distribution will be curtailed and employment kept at a minimum. There are other factors that add nothing to

the value of the product but **must** be absorbed in the cost. Such things as exorbitant selling costs, high taxes, large profits, inefficient operations and defective work should therefore be analyzed thoroughly and kept at a minimum.

We have heard the old saying many times, "You can only take out of something as much as you put into it." This philosophy is particularly illustrated in earnings and value of products.

Management, Too, Is Labor

Management, too, is labor in the strictest sense of the word and has certain necessary functions to perform in order to make possible a finished product to the customer. Therefore, there should be a definite understanding between labor and management. But management has apparently failed in the task of establishing and maintaining this understanding. Otherwise why should labor have to pay tribute to work? Why should workers have to have outside help to represent them to management? Why shouldn't each industry have arrangements to satisfactorily meet these requirements?

Sit-downs, slow-downs, strikes, interferences in production only add to the cost of the final product. Who pays for it? Labor and the public which again is labor. These weapons labor uses against itself to benefit only an extremely small number of people.

Labor and management should be cooperative to the fullest extent. Management must be fair, it must adjust itself to meet changing conditions. Fair wages and proper working hours must be established as well as fair prices. It is rather difficult to gear wages to profits accurately; therefore, it is desirable to adjust wages and allow labor to share in the profits. This adjustment must not be in the form of a bonus that might suggest charity. It should be indicated as actual earnings of labor. The share of the profit set-up should be fair and require only simple methods in calculating the extra compensation.

Why is it that a threatened increase in price always brings about a definite increase in business? Why is it that increases in prices usually take place when business is on the upgrade? Why not put this process in reverse? This might have a tendency to flatten out our production curves. Increase in business should reduce the final selling cost because there is more business to absorb fixed charges. The same thing is true when business is declining. Some thought to this subject may make the depressions less drastic.

Better Preparation for Working Life

It is admitted that there is a definite shortage of skilled help. Our educational system has been changed quite materially. For instance, a boy must go to school until he is 18. He cannot start on a trades training course until he is 18 years of age. These young fellows often feel this is too late to start a trades apprentice course. Many of them do not want to work at the lower wages of apprentices if they can obtain employment at higher wages. Our method of production today often gives these young fellows an opportunity to obtain higher wages in the production line rather than learning a trade.

However, there is something lacking and it is desirable that these young fellows have an understanding of industry and its problems. An investigation disclosed that only 15 per cent were able to continue their education in colleges; whereas the other 85 per cent had to find work wherever they could. A high school graduate today, in most cases, hasn't the faintest idea what industry demands of him in the production line. It should be industry's responsibility to see that all our high schools have adequate manual training departments where those young fellows who cannot continue their education can get an idea of machinery and what machinery can per-



• • •

By J. R. WEAVER

*Director Equipment, Inspection & Test,
Westinghouse Electric & Mfg. Co.*

• • •

form. It would be much simpler for the graduate to go to industry and ask for a job as a lathe hand, boring mill hand, etc., rather than go to the employment department and just ask for a job. Industry would also benefit in at least having some skill in the boy and having instilled in him an idea of the many problems in producing our products today.

Regardless of whether a young man is a high school graduate or a college graduate, he should start work in the shop if he is to follow manufacturing and management. Experience is the best teacher and the best experience can be obtained in knowing how a product is manufactured.

It is surprising to know that defective work and extra service due to mistakes added more than two billion dollars to the cost of all products in 1939. Much of this could have been avoided if management had provided better facilities and clearer instructions and by labor if it had exercised



more care. In the end labor again pays the bill.

Practical Suggestions

Therefore, why not definitely continue business improvement, put to work all the unemployed and get back to normal as soon as possible. Why shouldn't this be possible if management would:

1. Pay fair wages and establish adequate working hours.

2. Keep its labor advised of the operations and the status of the company.

3. Establish a fair, honest, simple, share-the-profit wage adjustment plan.

4. Provide suitable working conditions, even to the extent of air conditioning and cleaning in the shop.

5. Establish training programs for promising workmen for supervisory positions. (We point with pride to many of our leaders in industry as coming up from the ranks. There are still men in the ranks who could be just as capable if given an opportunity.)

6. Provide or advocate manual training in high schools.

7. Provide adequate facilities to produce a good product with the least effort.

8. Keep sales expense to a minimum.

Labor can also contribute to this progress by:

1. Giving an honest day's work for the compensation that it receives.

2. Keep interference in production to a minimum or eliminate them altogether.

3. Cooperate with management and help correct misunderstandings.

4. Help management in creating better methods in order to keep costs at a minimum. Most companies have suggestion systems and extra compensation can be obtained in this way.

5. Keep defective work to a minimum.

6. Realize that excessive taxes burden the cost of the product oftentimes to an extent that distribution is definitely curtailed. After all, labor and the public pay the taxes regardless of where they may be originally assessed.

I believe a cooperative spirit and a plan such as outlined above will help materially in bringing business back to normal and will absorb practically all of the unemployed. It is based on the fact that if everyone is employed and contributes useful work, he is entitled to his share of this work.

(CONTINUED ON PAGE 129)



WELDING SERVES

THE quickened pace of industrial activity, particularly since last September, has been definitely reflected in the welding and allied industries. Demand for welding machines and electrodes probably reached a new high last year.

From a process that before the World War was little more than a repair tool, welding has become one of the world's major production and construction methods.

Its wider application began during the war emergency and extended to the preparation of designs of all-welded ships of small size, which had not the Armistice intervened would probably have been produced in quantities for war use. Prominent in this pioneering was a special committee

of the Emergency Fleet Corporation, which committee early in 1919 founded the American Welding Society, notable for its promotion of fundamental research, the establishment of codes, standards, and educational activities that have materially advanced the application of welding.

Thus it may be said that the needs of war furnished the impetus for the growth of a process now capable of significant service in rapid and economical manufacture and construction, desirable in times of peace and vitally necessary in times of war.

The high status of the various branches of welding and their associated processes is mirrored in a number of recent developments.

of industrial piping. They provide three or more flames, two of which preheat both edges of the vee ahead of the point of welding. This markedly reduces the welding time as compared with previous gas welding methods.

Automatic Gas Welding

Machine gas welding using multi-flame heads is finding increased application. In addition to barrels, drums, tubes, etc., welded without the use of filler metal, steel containers having a single circumferential seam are being welded mechanically with the addition of filler metal.

Automatic gas welding in the assembly of bodies and covers of an oil float made of No. 28 gage terne plate is an interesting recent application. In this, eight fixtures mounted on a table revolve under a like number of standard single-flame torches carried on a bar above the fixtures. No filler metal is used. Production with one operator is 1500 units per 8 hr., with size held to close limits.

Mechanical bronze welding using vapor flux is another interesting development of the year. One application is in the bronze welding of fan blades for electric motors. Here, the blades and hubs are placed on a continuous conveyor, the parts are preheated and welded automatically, the flux being applied through the acetylene line by means of a vapor flux dispenser. Production is 3000 to 4000 units per 8 hr. day.

In gas cutting, now frequently termed "oxygen cutting," the most spectacular developments have been

Gas Cutting and Welding Mechanized

OXY-ACETYLENE processes have not only reached a high state of development, including mechanized application, but have increased in number. In addition to welding, cutting, and heating, they now embrace flame machining, flame hardening, flame softening and, more recently, flame strengthening, and flame cleaning and dehydrating.

Large scale application of one or more of these is becoming more common, with both gases frequently piped from a central source to various stations throughout a plant. In most steel mills, for example, the gases are thus distributed to a number of separate stations at the open-hearth, the slab yard, blooming and strip mills,

scrap yard, and the welding department.

Blowpipes or torches for welding and cutting continue to be improved in the direction of more effective utilization of heat, compactness, lighter weight, better balance. Interchangeable tips and heads permit use of one torch for either welding or cutting as well as for use on work of various thicknesses. New developments include a nozzle having a highly polished oxygen passage and other features designed to increase precision of cutting.

Multi-flame heads for specialized application continue to be developed. Those for pipe line welding are being increasingly used for the fabrication

INDUSTRIAL UPSWING

By R. E. MILLER
Machinery Editor, The Iron Age

in the mechanized units, which operate with jig-saw flexibility and are built to machine-tool standards of construction and control. These machines are now obtainable in a wide variety of types, both stationary and portable, and for work of almost any size or thickness. There are also machines for beveling and cutting of pipes and fittings, including one that will crawl around pipes, making one or two bevel cuts.

As many as eight torches, centrally controlled, may be used on some machines, for multiple-cutting of identical parts. Stack cutting by means of a single blowpipe or torch, hand

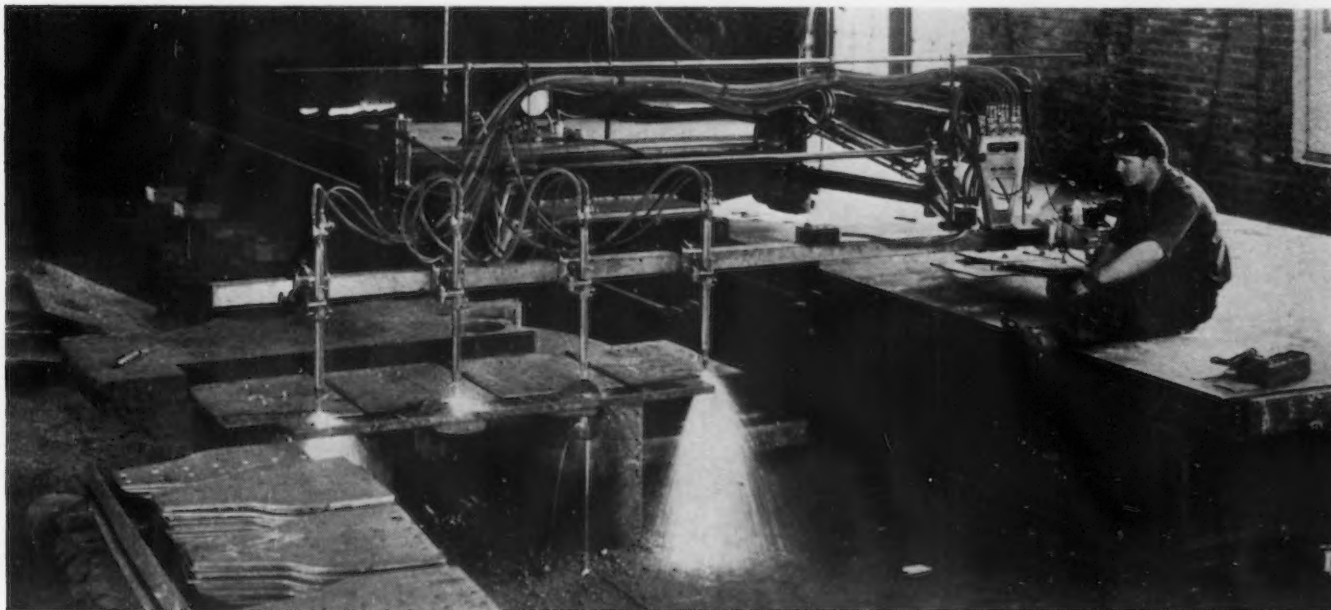
or templet guided, is also used for the production cutting of identical pieces at one set-up.

For the most part the carriage traversing mechanism or pantograph arms of these machines are motor driven, and in many cases the tracing mechanism is arranged for both motor and/or manual operation. Controls are centralized, and direct-reading speed and other dials are provided. Some machines feature duplicate controls at both torch and tracer positions. With modern machines, cut surface can be held to close tolerances on ordinary steel, and in many cases further machining is unnecessary.

Oxygen lance cutting continues to find many uses, not only in cutting steel difficult or impossible to cut by other methods, but in cutting non-ferrous metals and even non-metallics, such as concrete.

Plate Edges Prepared by Flame Machining

Flame machining, in which an oxygen jet removes metal by surface oxidation, has had its most spectacular application perhaps in the deseaming of slabs, billets, blooms, etc., in steel mills preparatory to finish rolling. Equipment for this has been highly



FOUR torches operating in unison cut four of these shapes from $\frac{3}{8}$ -in. plate in 4 min. The shapes are 25 in. long and 7-19 in. wide. A magnetic tracing device propels and guides the torches, enabling the operator to give his entire attention to the cutting. (Courtesy Air Reduction Sales Co.)

developed and includes mechanical units for operation on material at rolling temperature and in the rolling mill production line.

More recently the gouging principle of flame-machining has been applied to the preparation of plate edges for

welding, U-grooves or other edge contours being made by hand or machine. The blowpipe employed was developed originally for removing metal from the underside of welds, removing temporary welds, and for certain maintenance and scrapping operations.

Arc Welders Put to Wider Use

IN arc welding, equipment has undergone continuous improvement, and present designs undoubtedly make welding more economical than ever.

The newer d-c machines feature improved welding characteristics, especially in the lower amperage ranges, one large manufacturer attributing this to refinements in design details which result in extremely fast voltage recovery and adequate limitation of current surges. There is a pronounced trend toward simplified control and compact construction, particularly in

the smaller ratings where high-speed sets are making their appearance.

Sales of welding machines and electrodes increased last year. Industries most active included shipbuilding, heavy machinery manufacturing, railroads and car builders. Export demand was heavier; one large company reports steady increase for several years but a demand last year that exceeded that of the two previous years.

Use of a-c welding equipment continues upward, with transformer type machines most popular. The trend has been in two directions, namely for

furnishing large amounts of power for automatic systems of welding and for furnishing unusually low welding currents. One authority points out that improvements in a-c electrodes have stimulated use of a-c in the field of medium and light welding operations.

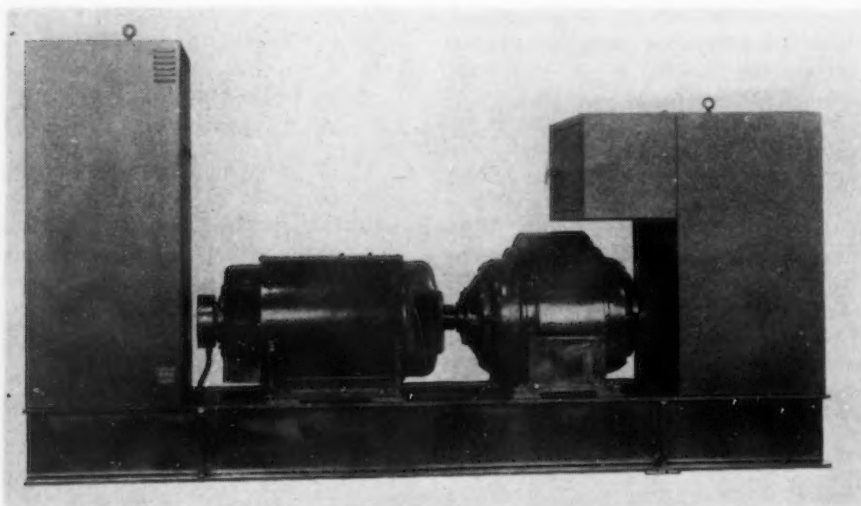
Multiple-operator sets were also in greater demand during 1939, due largely to the upswing in shipbuilding. Increased use of automatic welding is attributed both to equipment improvements and a rapid expansion in fields to which automatic operation is adapted. General business improvement is also a factor.

New electrodes continue to be developed and existing ones improved in quality and uniformity. They are available in wide variety for welding of all metals. One company notes a large increase in flat welding and states that the differentiation between electrodes for flat welding and those for making horizontal fillet welds is becoming continually more pronounced.

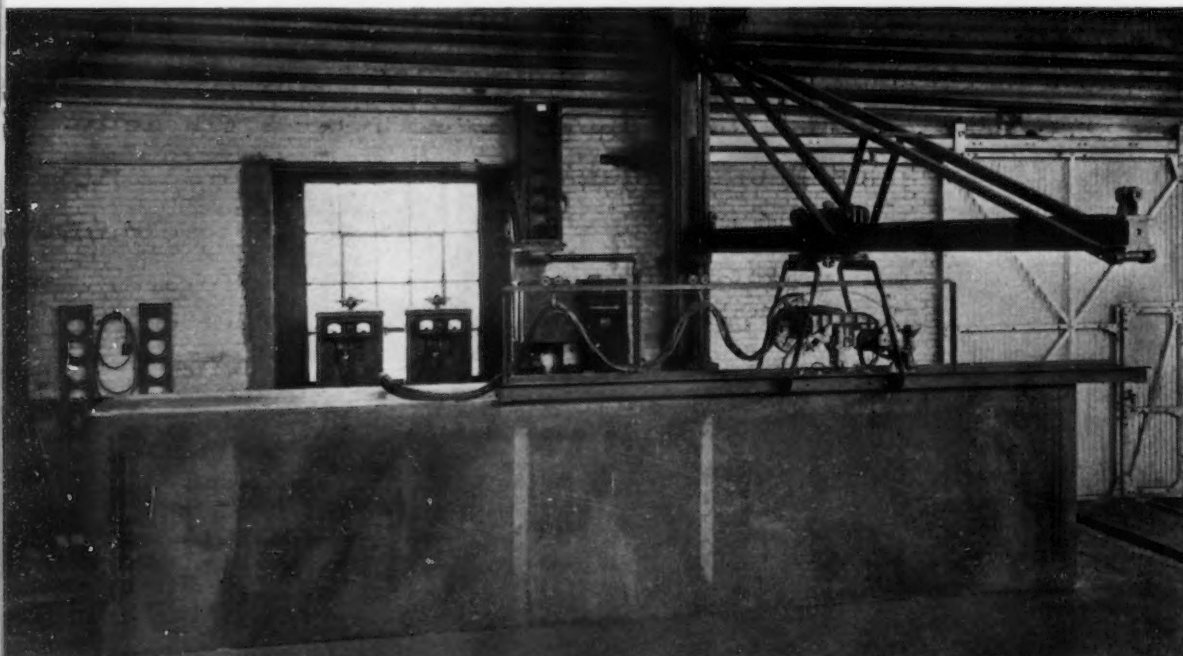
A-C Sets Predominate in Equipment News

New or improved arc welders announced during 1939 were numerous, with a larger than usual proportion in the a-c transformer field. They included a square frame, single-current control, 200-amp. arc welder requiring floor space of less than 3½ sq. ft. Built for vertical stacking and parallel hook-up, two of these units give two welding services of 200-amp. each, or one 400 amp. service. A single "multiple shifter" provides accurate current settings on two or more machines simultaneously.

A small 200-amp. unit for belted or coupled drive, and a 300-amp. diesel engine driven unit with auxiliary gasoline starting motor were introduced by another company. Dual continuous control, a system which per-

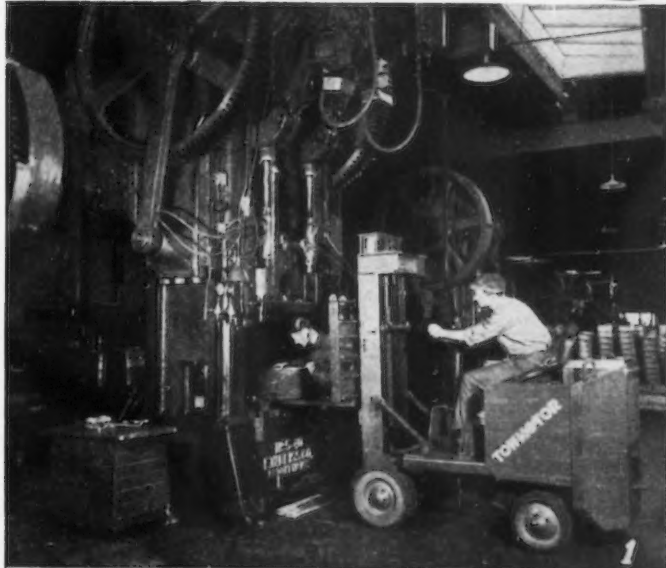


CONSTANT-potential motor-generator arc welding set, 1500 amp., for multiple-operator and automatic machine welding. It is built by the General Electric Co.



STEEL annealing box being fabricated by Unionmelt automatic electric welding process. The welding head is mounted on a carriage which traverses a track that can be raised, lowered and positioned by means of crane. (Courtesy Linde Air Products Co.)

TOWMOTOR CLEVELAND MOVES IT THROUGH 6 FACTORY Operations



CUTS HANDLING COSTS IN A TYPICAL STAMPING AND ENAMELING PLANT

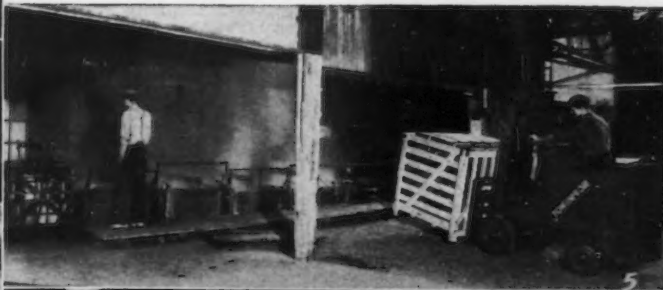
- 1 — Moving dies in and out of presses.
- 2 — Handling sheet steel from storage to shearing.
- 3 — From shearing machines to notching presses on skids.
- 4 — From notching presses to draw presses on skids.
- 5 — From storage to pickling room in crates designed for the job.
- 6 — Stacking to ceiling to conserve space in storage rooms.

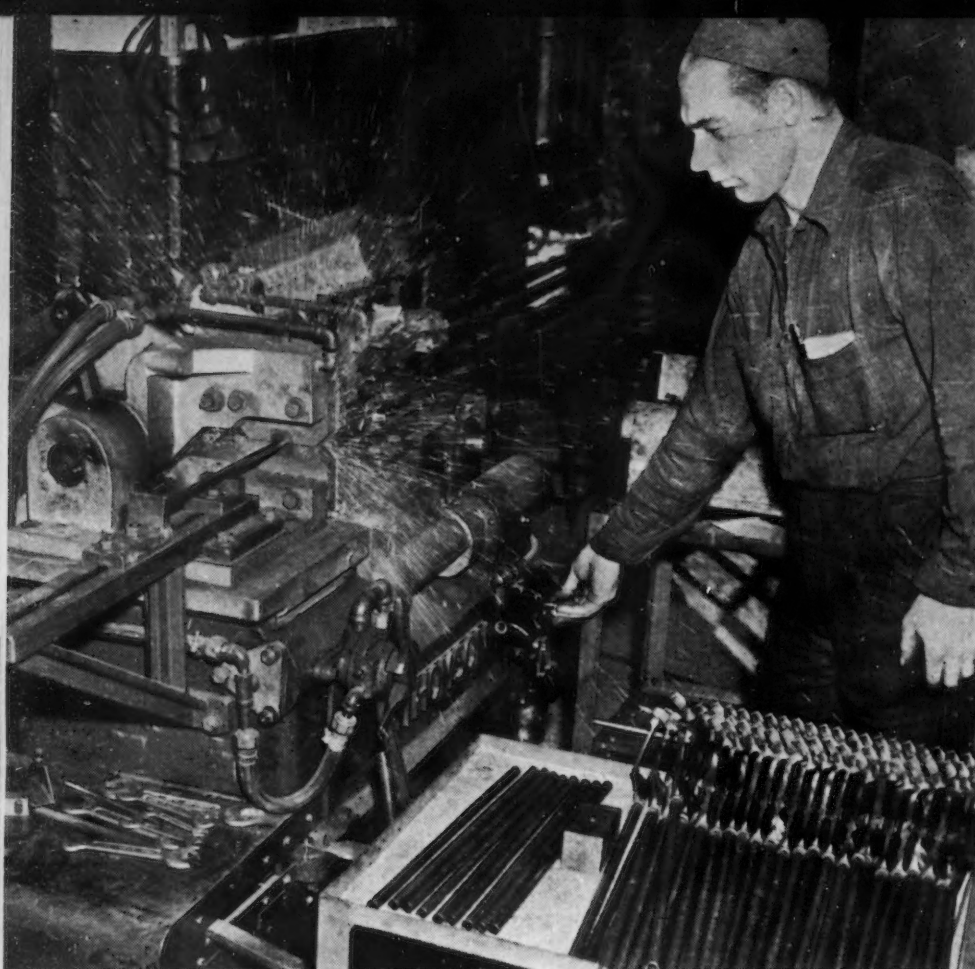


All photos showing these six Lift Truck operations taken in the plant of the Strong Manufacturing Company, Sebring, Ohio. These are all performed with the same TOWMOTOR, showing the versatility and maneuverability of the lift truck with a reputation for greater economy. Let us show you how TOWMOTOR economies can be applied to your own plant.

TOWMOTOR CO.

1231 East 152nd Street, Cleveland, Ohio
SALES OFFICES IN PRINCIPAL CITIES





mits independent adjustment of voltage and current, features the newer machines of this company.

Compact and streamlined a single-operator motor generator set of another company features control by a single handwheel, accurately calibrated. Polarity is controlled by a snap switch and accidental reversal is impossible.

A new 1500-amp. constant-potential arc welding set for supplying heavy current demands of automatic welding and the requirements of production hand welding by a number of operators has been announced. Features include greater compactness, lighter weight, easier installation and more convenient control.

New accessory equipment includes an "arc length monitor" by means of which a welding operator is informed of over or under voltage conditions at the arc by light signals inside his helmet.

Low-Current Electronic Welder

The several a-c machines announced during 1939 included a low-current electronic arc welder that can be used to weld with currents as low as 5 amp., using newly developed 1/32 and 3/64-in. electrodes. Its range is from 5 to 75 amp., divided into parts. Sheets as thin as No. 32 gage are said to be handled without difficulty. The heart of this portable welder is a multiple-tube polyphase mercury vapor rectifier unit.

A new oscillating current transformer type welder features high efficiency and high power factor through a system utilizing inductively, oil-filled condensers in both primary and secondary circuits that are automatically thrown in and out. Open circuit voltages of 65 and 90 are fixed. At 65 the stepless range is from 20 to 445.

Heavier equipment included a new 500-amp. a-c arc welder that can be used by two operators simultaneously drawing from 30 to 280 amp. each or by one operator drawing up to 560 amp. Electrodes from 1/16 to 1/2 in. can be used.

For multiple-operator operation, a multiple star a-c system employing a single "mother transformer" located preferably outside the plant is available. A single wire along the walls of the welding shop connects with take-off boxes and outlets at strategic points. The operator has but one welding lead, and voltage and current can be regulated according to the needs of the job and without interference with other stations. Open circuit voltage is 30 volts maximum.

(CONTINUED ON PAGE 160)

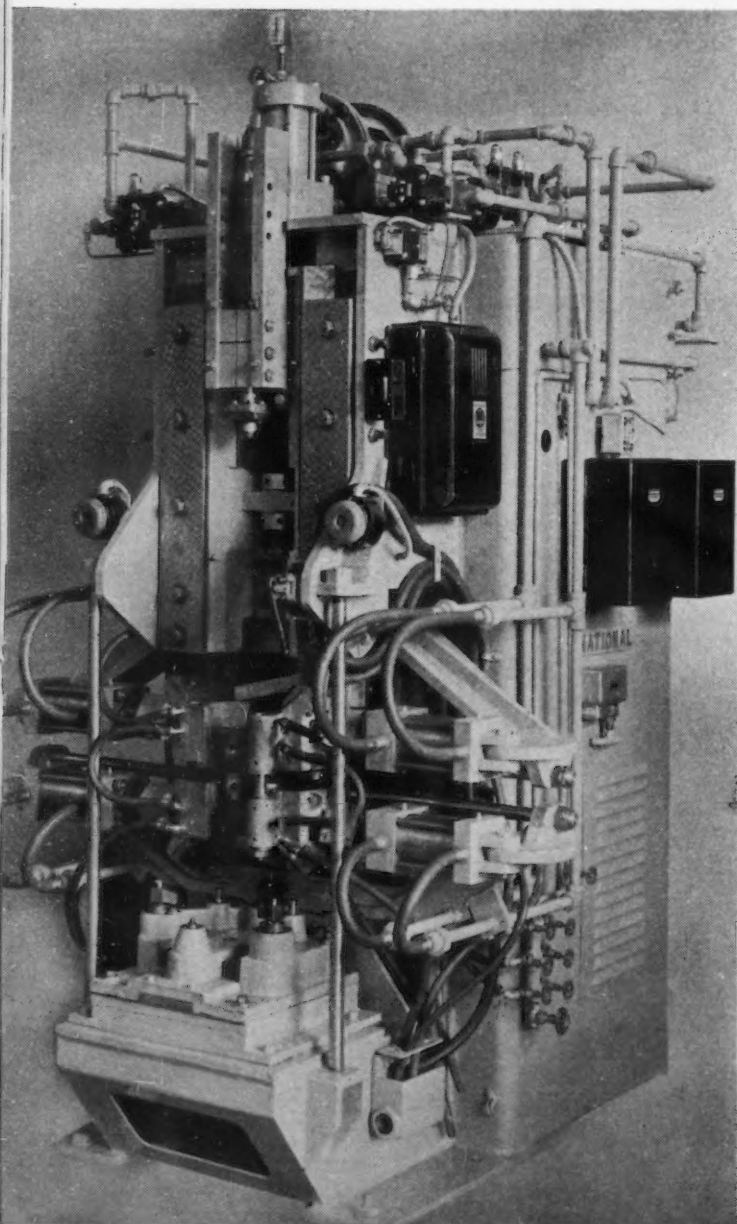
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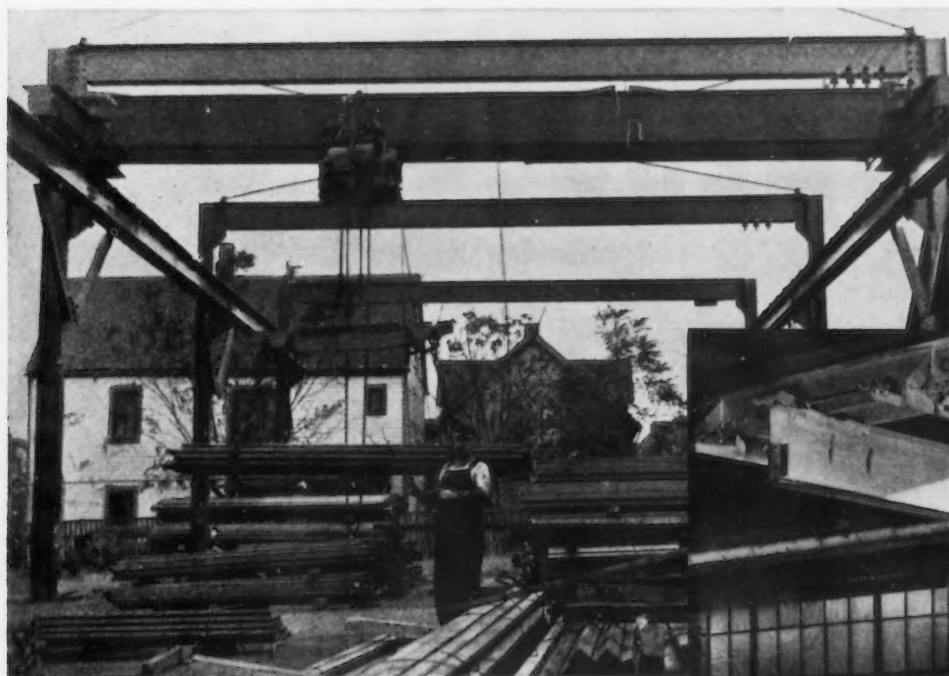
BARRELS for the new high-speed semi-automatic boltless M-1.30 Garrard rifle are flash welded. The unit here shown is a Thomson-Gibb machine. (Pictures, Inc.)

o o o

AT LEFT

LARGE projection welder for welding torque tubes to rear axle carrier assembly, a job made practical by interrupted heat control. (Photo by courtesy National Electric Welding Machines Co.)

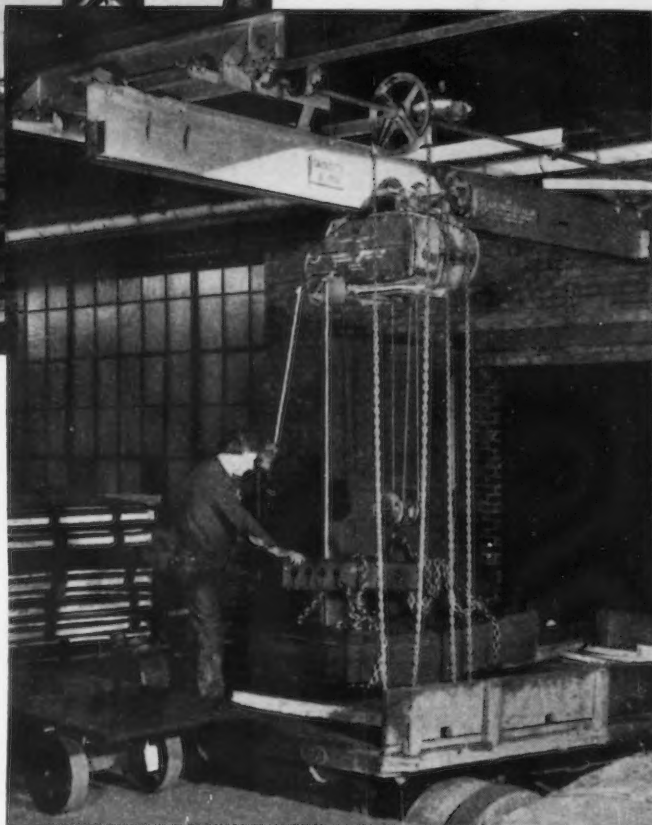




(Left)—Thousands of tons... 25 different analyses of forging steel... easily stocked in a 25 ft. x 100 ft. bay.

(Below)—Two years of handling incoming sheet and outgoing products—and the first repair dollar yet to be spent!

R & M low headroom hoists also supplied with special grabs or rectangular electric magnets for handling sheet steel.



SHEETS or BARS

R & M

HOISTS

Keep Things Moving!

Today's production schedules won't keep you awake if Robbins & Myers hoists are doing your lifting jobs.

These two totally different installations, worked out by R & M field engineers to meet specific requirements, indicate the scope of R & M hoisting equipment—and the way we go about untying knots in the production line.

Let us go to work on *your* problem. It may be tough, but R & M has cracked some armor-plated puzzles and come out with *profitable* answers!

Probably one of the 2000 R & M hoists will fill the bill. If not, we will be glad to design No. 2001 for you. In any case, we'd want to come to your plant first, get the benefit of *your* experience with the job, and do some careful figuring.

Write today outlining the job and what you want to accomplish. There's absolutely no obligation, and your letter will bring a competent engineer to advise with you—NOT one of the "high-pressure boys."

Write us that letter now, before it slips your mind.

ROBBINS & MYERS • INC.

HOIST AND CRANE DIVISION
SPRINGFIELD • OHIO

MACHINERY IN LATIN AMERICA...

MORE machinery is exported from the United States each year than from any other country in the world, and one-quarter of it, over the last eight years, has gone to the 20 republics we lump too casually together as Latin-America. Our current rate of shipment of industrial equipment to Central and South America is close to \$70 millions yearly, out of our total world exports of nearly \$300 millions. Add to the Latin-American share one-fifth of the \$10 millions representing our foreign consignments of printing equipment, and one-fourth of the \$70 millions represented by farm equipment exports, and the total annual Latin-American purchases of our machinery become very impressive indeed.

While American builders of a few important types of equipment—machine tools, for example—have at present some reason to consider the South American continent a very minor market for this specialized machinery, a review of the entire subject by producers of most kinds of equipment will probably bring an understanding, and a sympathetic one, which will assist in timing properly a long-range foreign trade program with the nations of South and Central America.

When machinery builders of the United States set out to gage the republics of South and Central America as present and future markets for our equipment, it should be realized that the present grave European conflict has only emphasized, and has not

By L. M. LIND
*Chief, Machinery Division, United
States Bureau of Foreign and
Domestic Commerce*

o o o

really caused, the generally unanimous feeling in the minds of our southern neighbors and our countrymen that in this hemisphere we have the best chance of any world area to work out our own destiny, and to form an economic and spiritual unit in some degree insulated from the difficulties which regularly beset the Old World and the Orient. Our 250 million people in the New World, with different customs, with both parallel and divergent histories, and with both conflicting and complementary economies, have a practically identical attitude toward world affairs, which differs among the American republics mainly as military resources vary.

It was scarcely an accident that steamship lines on Central and South American cruises experienced record-breaking tourist bookings of United States citizens two years ago, nor that resolutions voted by the delegates of the 21 republics of the Pan-American Union have tended more easily to be unanimous in recent years. It appears that the Pan-American hopes and ideals of Simon Bolivar, the liberator of many of our sister American republics, are coming very close to realization after 115 years of vacillation and indecision.

Machinery plays an important part in the development of the Western Hemisphere, and it will in all probability be machinery of United States manufacture. A brief glance at types sold will suffice to show the past trends and future development we may fairly expect. Up to this time, as could easily be guessed, the machinery sold in heaviest volume has been of the rugged, pioneering, outdoor type necessary to make life worthwhile in virgin country, and to wrest from nature its resources.

Three Classes of Machinery

Bearing out this generalization, it is interesting to observe that 48 per cent of all our power-generating equipment exports — diesel engines, turbines, steam engines—was sold to users in South America and the Caribbean area in the first half of 1939. Forty-five per cent of our mining, well, and pumping equipment exports went to this region in the same period. One-third of our construction and conveying equipment consigned abroad in the first half of this year was shipped to Latin-America. It has usually, in recent years, been an even greater share.

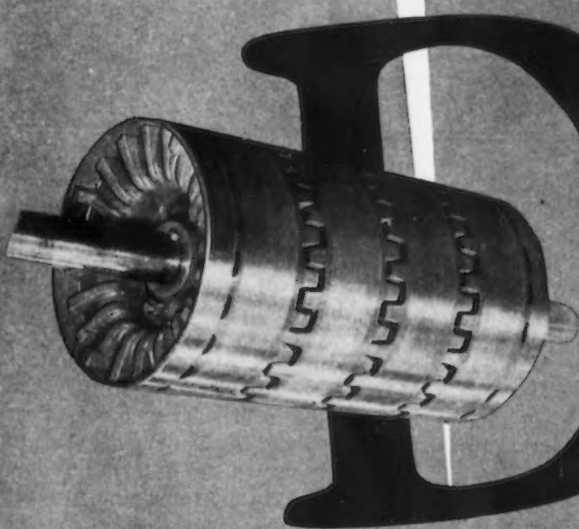
The second grand grouping, which goes to Latin-America at present in less outstanding volume—one might say an "average" share—consists of machinery not particularly involved in "clearing the wilderness," and yet not indicating necessarily an highly-industrialized economy in the purchasing country. Among these kinds of equip-

It's

- The most powerful magnetic pulley on the market size for size, with air-cooled construction and bronze spacers — for foundry sand conditioning and all separations where a conveyor belt is used.
- High Intensity separators for the metal working plants to separate ferrous and non-ferrous metals.
- Powerful, rugged High Intensity lifting magnets with exclusive features of design which have set a new pace in metal handling.
- Mill type magnetic clutches to solve the problems of remote control, slippage, end thrust, fast jogging.
- A magnetic analysis laboratory rendering free service to industry in solving iron-removal problems.

These are a few of the contributions made by Dings, world's largest exclusive builder of magnetic equipment, to help the industry save time and money, and produce better products. When it's a question of magnetic equipment, call on Dings.

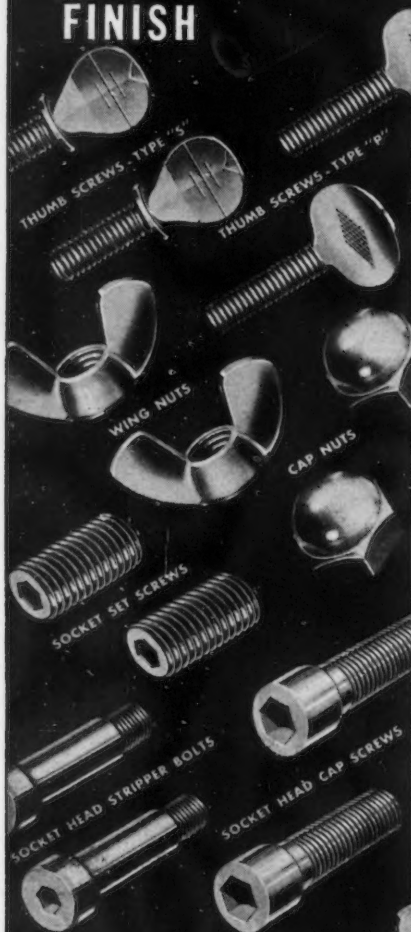
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663 Smith Street, Milwaukee, Wisconsin



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FOR STRENGTH...
UNIFORMITY...
FINISH**



Produced by an improved process, developed through years of experience in the manufacture of precision screw products, Parker-Kalon Wing Nuts, Cap Nuts, Thumb Screws and Socket Screws have the quality that wins unqualified approval of engineers and production men. Write for free samples . . . compare . . . see for yourself. Stocked by reliable industrial distributors near you.
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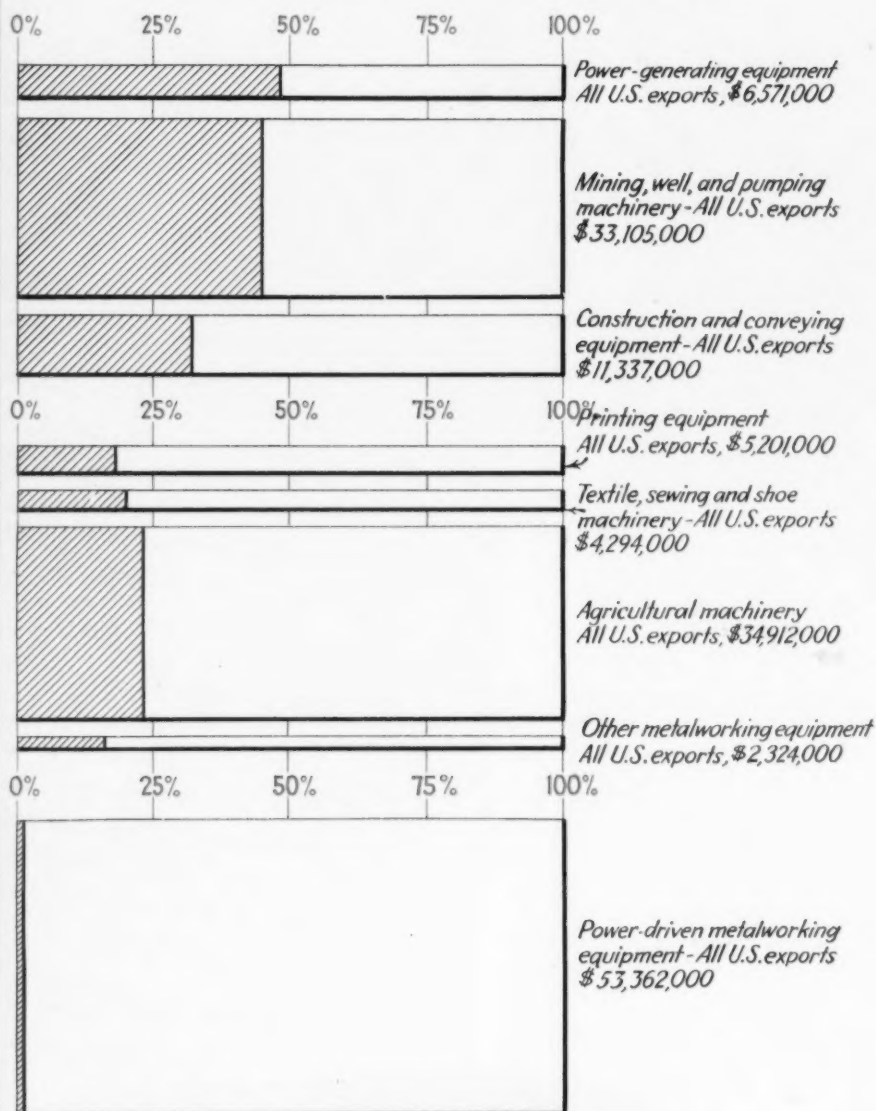
**SOCKET SCREWS
WING NUTS · CAP NUTS
THUMB SCREWS**

SOLD THROUGH REPUTABLE DISTRIBUTORS

UNITED STATES MACHINERY EXPORTS

FIRST HALF 1939

BY EQUIPMENT TYPES, SHOWING LATIN AMERICAN SHARES



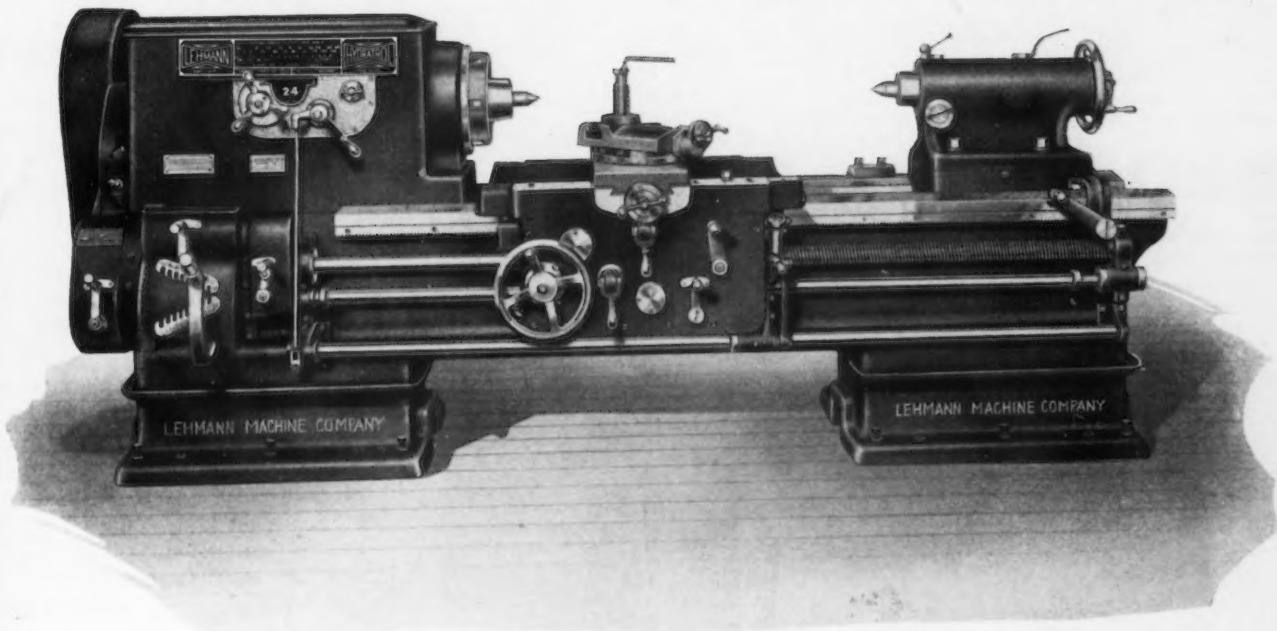
NOTE: Shaded areas indicate Latin American share of all U.S. exports

ment are our exports of printing equipment, in which the Latin-American share is 18 per cent; textile, sewing, and shoe machinery, of which 20 per cent went to Central and South America; and farm equipment, 23 per cent to Latin-America.

The third and last of the great classes, the one in which is found machinery of a type sold only to a very slight extent in the countries of South and Central America and the West Indies, are those machines which have been developed to make possible our mass production of fabricated metal products, into which accuracy, strength, and durability are built. Our American-built machine tools, the best illustration of this kind of precision

machinery, are currently sold in world export markets at the rate of more than \$100 million a year—yet all Latin-America bought only \$700,000 worth in the first half of this year, which represents only one and three-tenths per cent of our machine tool exports. This bears out strongly the observations made above to the effect that the type of equipment sold to Latin-America does not yet follow the pattern, proportionately, of that sold to highly industrialized manufacturing countries. While machine tools—our marvelous multiple-spindle drills which drill all the holes in an automobile motor block in a few seconds—are not yet in demand in Latin-America, simpler metal-working ma-

LEHMANN HYDRATROL LATHES



WE BELIEVE
THAT THIS 24 INCH EXTRA HEAVY DUTY LATHE
REPRESENTS
THE HIGHEST DEVELOPMENT IN A MACHINE OF ITS SIZE
AND THAT IT

IS HEAVIER
IS MORE POWERFUL
IS MORE EASILY OPERATED
IS MORE AUTOMATICALLY LUBRICATED
IS MORE COMPLETELY ANTI-FRICTION EQUIPPED

THAN
ANY OTHER LATHE OF COMPARATIVE SIZE

THE HYDRATROL LATHE

IS BUILT IN SIZES 16 INCH TO 36 INCH
AND UP TO 16 INCH HOLE IN SPINDLE

ALSO

STANDARD GEARED HEAD LATHES
SIZES 16 INCH TO 24 INCH

BY
LEHMANN MACHINE COMPANY

CHOUTEAU AT GRAND BLVD.
ST. LOUIS, U. S. A.

UNITED STATES MACHINERY EXPORTS

(First Half 1939)

By Equipment Groups—Latin American Percentages of Total
(In Millions of Dollars)

	World	Latin America	Latin America, Per Cent of World
Group I			
Power generating	\$6.571	\$3.182	48
Mining, well, and pumping	33.105	14.896	45
Construction and conveying	11.337	3.681	32
Group II			
Printing	5.201	0.959	18
Textile, shoe, and sewing	4.294	0.887	20
Farm	34.912	8.266	23
Other metal-working	2.324	0.365	16
Group III			
Power-driven metal-working	53.362	0.702	1.3

chinery, such as foundry equipment, is used in the nations of Central and South America to the extent of one-sixth of our total exports of that class of machinery.

Relation of Groups Is Steady

Our total machinery trade volume with Latin-America in 1939, which, as has been pointed out, is at the rate of about \$86 million per year or slightly more, has been consistently very close to the proportions mentioned for each class of machinery in each year since 1932. Although our 1939 exports will total about *five times* what they were in 1932, it is remarkable that the shares of each type of machinery have been so constant during this unusual rise. It seems to indicate a general rise in purchasing power and *over-all* productivity in Central and South America, rather than any sporadic increase in oil production alone, or some sudden, isolated demand for staple foods for Europe.

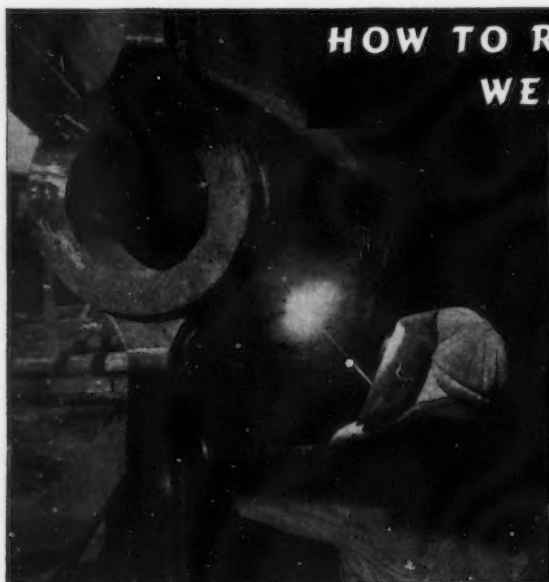
United States builders of engineering products have been enjoying the lion's share of the Latin-American machinery trade. Against our own exports of \$86 millions to those countries, the German portion of the business, even before the current war, was only about \$35 millions. Add another \$25 millions worth of equipment going to Latin-America from England, Sweden, Belgium, Switzerland, France, and Italy, and you have all the machinery bought in the course of 1938, for example, by all the countries south of the Rio Grande.

It will probably not strain our imagination too severely to visualize an appreciable *percentage* rise in our share of Latin-America's machinery trade over the next year or two. The absolute dollar value should also increase, but such gain is likely to be relative and due to continued progress in Latin-American industrial development.

What Germany Sells S. A.

Before discussing factors in favor of and against our own trade prospects with Latin-America in future years, it will be worth while to glance at the equipment bought by Venezuela, Chile, Brazil, and the other countries from England and Germany last year. German competition in power-generating units was particularly strong. Stationary diesels, sent to Mexico with a landed price of about \$20 per horsepower, or hydroelectric units bartered for cotton or coffee, presented Amer-

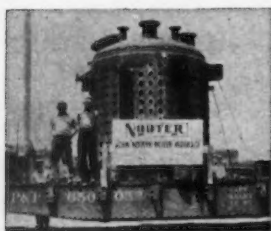
HOW TO REDUCE YOUR WELDING COSTS



From coast to coast, in plants fabricating welded structures of every description, Murex electrodes are helping to reduce welding costs. The reasons why are many. In one plant high burn-off rate may prove an advantage. In another, rapid deposition, or lack of spatter and smoothness of deposit may do the trick.

There is little question but what, in your plant, too, these Murex features can effect real economies. Why not write today and ask to have a representative demonstrate Murex. No obligation is involved. And, if you have a problem or two concerning welding procedure, his broad experience may prove extremely useful.

1 In marine work, vertical and overhead welding goes easily and quickly with Murex Vertex (reverse polarity) or Genex (straight polarity). Photo courtesy Ira S. Bushey & Sons Co., Inc., Brooklyn, N. Y.

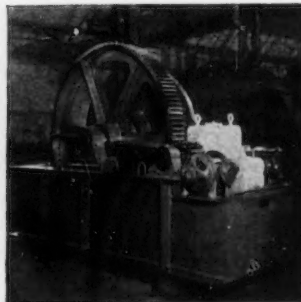


2 Only 2700 lbs. of Murex welded this 40,000 lbs. jacketed still. Photo courtesy John Nooter Boiler Works Co., St. Louis, Mo.

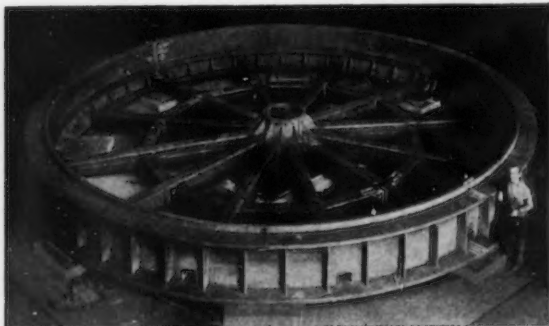


3 High speed deposition saves time and money on the Lorain 79 Shovel. Photo courtesy The Thew Shovel Company, Lorain, Ohio.

We've a pocket-size pamphlet giving properties of all electrodes in the Murex line. Send for your copy.



5 Economy of welding machinery such as this sluice gate hoist is increased by time-saving Murex Electrodes. Photo courtesy Lakeside Bridge & Steel Co., Milwaukee, Wis.



4 Free-flowing Murex downhand electrodes speeded welding on this 96,200 lb. pot chuck, 33 ft. 7 in. in diameter, believed to be world's largest. Photo courtesy Lukenweld, Inc., Coatesville, Pa.



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Tool Holders and Tools

There is an inherent quality built into ARMSTRONG TOOLS that sets them apart from all others, an extra strength, finer balance, and more accurately worked out designs—more "tool sense" and the quality and finish made possible by modern manufacturing methods. It's a sound tool policy to standardize on ARMSTRONG TOOLS all the way — because they assure a long trouble-free service.

ARMSTRONG TOOL HOLDERS

... are used in over 96% of the Machine Shops and Tool Rooms; they are the backbone of any industrial tool department. The Armstrong System provides tool holders for every operation on lathes, planers, slotters and shapers.

ARMSTRONG TURRET LATHE AND SCREW MACHINE TOOLS

have extended the economies and efficiency of the Armstrong System to the Production department.

ARMSTRONG DROP FORGED "C" CLAMPS

"Heavy Duty," "Medium Service," "Light Duty," "Deep Throat," and "Tool Makers," each in all sizes—universally recognized as the finest "C" Clamps made.

ARMSTRONG LATHE and MILLING MACHINE DOGS

Drop Forged from special open hearth steel, alloy steel screws and hubs large enough for re-tapping, 12 types, including Square Head, Headless and Safety Head types in all sizes.



ARMSTRONG BITS AND BLADES

ARMSTRONG High Speed shapes ready to grind or ready-ground, also ARMIDE Carbide-Tipped Cutters.

ARMSTRONG RATCHET DRILLS

11 types. All steel construction with improved action and hardened parts.

ARMSTRONG WRENCHES

Wrenches of greater strength, improved design, better tool balance and finish—highest quality. Drop Forged Carbon Steel and Vanadium Steel Open Wrenches, Box Socket Wrenches, Detachable Head Socket Wrenches, Hollow Screw Wrenches, and Bridge Ratchets, 67 types in all sizes.

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the most complete line manufactured with each tool brought up to industrial standards.

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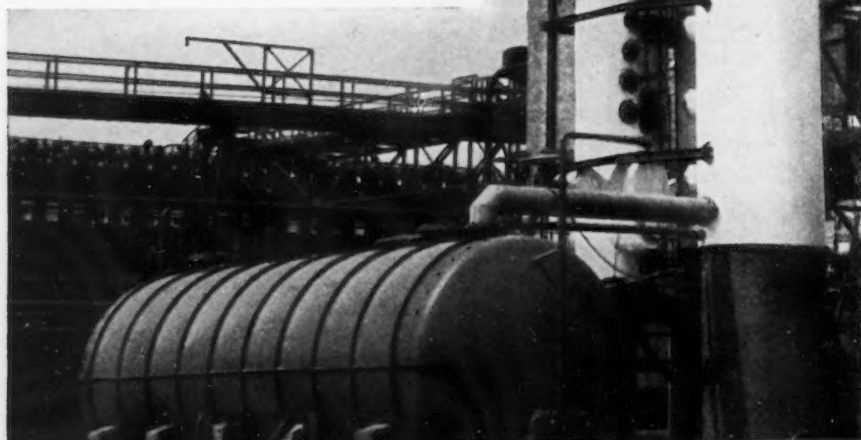
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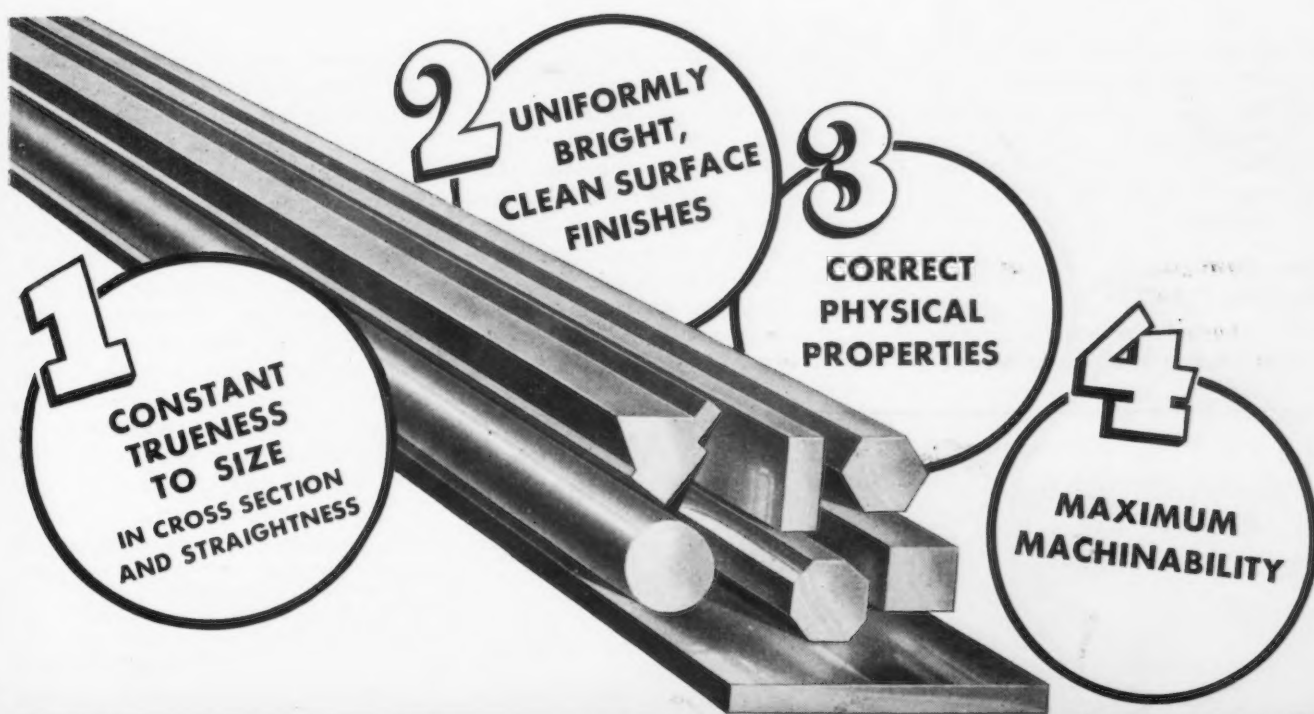
ican firms with an extremely disagreeable type of competition. German machine tools, the spearhead of Germany's trade drive, sold in Latin-America in a little heavier volume than did our own. One might say the spearhead was blunted a bit in being directed toward Latin-America, however, for the German sales were only very slightly ahead of those from the United States, in spite of barter, compensation marks, and long terms of payment.

A curious situation obtains in world textile machinery trade, and Latin-American imports of this equipment were no exception. While the United States production of this equipment is larger than that of either Germany or England, each of those countries usually sells more than \$30 million worth abroad each year, compared with our own relatively insignificant share of \$7 to \$10 million. Of our world exports of textile equipment in the first half of 1939, worth somewhat more than \$4 million, less than one million dollars worth went to all the Central and South American countries.

It is entirely reasonable to assume that United States builders of machinery will continue to dominate the South American market. It is likely, too, that a certain unpredictable part of the equipment formerly supplied by Europe will also now be shipped from the United States. Some of the factors can be influenced partly or entirely by our own machinery builders while others will work out, in one way or another, because of developments completely beyond our own control. A tabular listing of the problems, some inter-related, others distinctly separate subjects, will be helpful in emphasizing the variety of factors which will have a part in determining the outcome:

1. European Payment for South American Products

It is to be presumed that some of the European belligerents will purchase Latin-American foods and staples in heavy volume in coming months. If those countries should specify that sterling funds or francs be kept in South American banks to pay for French and British machinery, for example, when and if it can be spared and exported, United States equipment builders would benefit only slightly from increased Latin-American pro-



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perity. If, on the other hand, these proceeds from beef, wheat, and coffee arrive in South America with no "strings" on them, our own engineering industries should enjoy increased business.

2. Our Own Imports of South American Products

One of our main difficulties in trading with Latin-America

has been that, while they need our fabricated goods, prominent among which is our machinery, their ability to buy is limited each year because they cannot build up dollar balances in their banks to pay for our equipment through the sale of their raw materials. We have our own surpluses of beef and wheat, products which Argentina would like to sell to us; we

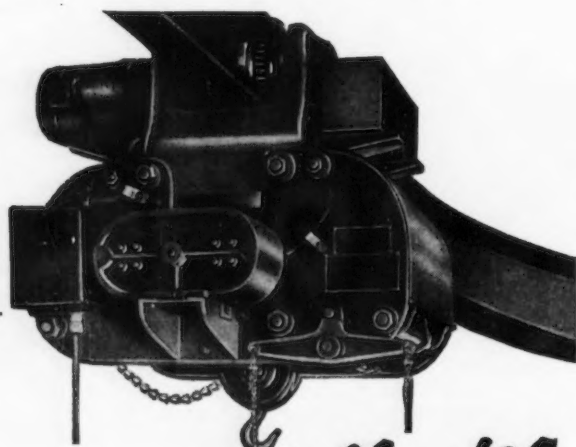
have our own cotton, another item which Brazil would like to supply, and we are already buying about as much Brazilian coffee as we can conveniently use. A very urgent present problem for us is the development of Latin-American specialties which can be shipped to this country in sufficient volume to enable them to increase appreciably their purchases from us. To accomplish this and to confine such commodities to those which do not compete with any of our own products is a large order, particularly in a nation with an economy and production as diversified as ours.

3. Financial Aid

Purchasers in South America have been conditioned to lenient terms in their imports from Europe in recent years largely because of politico-economic policies of European nations. We have a situation before us which will call for an acute perception of both the difficulties and the possibilities inherent in the Latin-American trade picture. While we know it will be difficult for those machinery-importing countries to shift from a barter to a cash-with-order basis, in some transactions this may be the safest course. Admitting some validity to the other side of the case, intermediate terms in buying capital equipment for a newly-developing country are frequently a necessity—the degree of validity varying with the credit standing of the purchaser in each transaction and the exchange conditions existing in his individual country.

4. Complete Plant Projects

One more difference between European and American machinery export methods stands out at least as prominently as the divergence in granting terms. This is in the willingness on the part of Europeans to assist in constructing "turn-key" jobs (furnishing all the diverse machinery, erecting the factory, and getting production started) for industrialists in Latin-America who lack the engineering knowledge necessary



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to build, equip, and get the factory going themselves. Our own machinery builders tend to be interested only in selling their own equipment; if a Venezuelan, for example, wishes to buy a soap factory, he must collect the many items of equipment himself, then learn how to put together and use them. American firms might get in touch with each other, those making allied but non-competitive machinery, and help the Latin-American customers on this.

5. Proper Resident Agents

In sending or choosing an agent to represent them in Central and South America, United States firms should choose either an American or a citizen of the country to which he is accredited. There are not many instances where an Englishman, a Japanese, or a German is as good an agent for a United States firm as an American would be, unless, perhaps, it is an Argentine in Argentina, or a Mexican with a wide acquaintance in Mexico. Even as among Americans, selection should incline toward a man who knows the product, and who is personable and businesslike—not to an American of the soldier-of-fortune type, or to one who gets an agency contract and an all-expense tour by speaking knowingly of romantic Latin-American spots, but who has a susceptibility toward "going native" or becoming an urban species of beachcomber. This latter type has been reportedly seen with increasing frequency since the first of September, announcing get-rich-quick schemes and new golden opportunities for all who are willing to export to Latin-America.

The same old precepts for promoting trade still apply—now as always; a conservative, yet sympathetic, resourceful, and energetic sales promotion program will accomplish and maintain, in our machinery trade with South and Central America, far more than shortcuts, opportunistic seizure of a purely temporary advantage, or a poorly-sustained "let-George-do-it" kind of foreign trade policy.

Depressions Challenge Management

(CONTINUED FROM PAGE 113)

The merits of workmen's organizations have been discussed from many angles. However, there is no reason why a union or any such organization should work to the disadvantage of either management or employee. A

union should be an educational mechanism for its members just as we have engineering societies, professional societies, etc.

How much better it would be if a union could keep its membership posted on the status of the company for which the members are working. It could keep its members advised of incoming business, shipments, cost of development, investments, profits and many problems with which manage-



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ment contends. A better understanding of this kind without a doubt would create a more cooperative spirit between labor and management and be to the advantage of labor.

The union could keep its membership advised of the many different problems facing our economic system. Labor should know of the various elements that contribute or disturb this system and how they affect earnings, profits, costs, etc.

Just as engineering societies have committees to study various engineering problems, so should the union have

committees to study manufacturing problems within the company. Each problem should be thoroughly analyzed by these committees and instead of just complaining, definite recommendations should be made for their solution. I am sure management would be most receptive to such a setup.

As mentioned before, labor is the principal cost content of every product; therefore, in order to keep costs within the purchasing power of the public, labor can contribute materially by recommending better manufacturing methods and improved tools and

equipment. A committee to study the recommendations of the members of a union could very well contribute quite materially to improving manufacturing methods.

Cooperation between labor and management will eliminate misunderstandings that lead to production disturbances. A labor union organized along an educational line will create a better understanding of the problems faced by both management and labor and will tend to a closer cooperative effort on the part of both.

The Outlook For Steel

(CONTINUED FROM PAGE 61)

Many significant technical advances have made an appearance recently. High-powered, safety-beam headlamps, with lens, bulb and reflector integral, have been generally adopted as a result of a joint effort of automobile manufacturers and the electrical manufacturing industry. Curved, tempered glass in rear window lights of 1940 cars presage a swing to curved windshields. A new trend initiated by the Chrysler "fluid flywheel," is carried forward by Oldsmobile in a power transmission arrangement that eliminates the clutch pedal and offers completely automatic gear shifting with four speeds forward and an automatic "kick-back" under certain driving conditions. Packard climaxes the comfort features of modern automobiling by offering an air-conditioning system for cars, including cooled air for summer.

Plastics as a group have made considerable progress, with more general use of these materials for decorative purposes, although structural usage is mainly an experimental consideration.

Few Changes in 1941 Cars

The present attitude of the industry is that few important mechanical changes are likely in 1941 models. Success of current models, the fact that new tooling must be written off, and possible difficulty in getting delivery of machine tools and special equipment this year are factors dictating this attitude.

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FLOOR SPACE REQUIREMENTS: Single unit construction cuts floor space requirements in half. Machine illustrated will make up to 1½" tube—space required 21'0" by 6'0".

McKAY FORMING ROLL DESIGN: Maintains accurate seam alignment, necessary for good seam weld. It also produces a smooth tube, with size maintained closer than commercial tolerance requirements.

CENTRALIZED CONTROLS: Heat, speed and pressure controls placed for maximum convenience of operator.

QUICK CHANGE-OVER: Actual production conditions prove that a complete change-over from one size tube to another can be made in less than three hours by regular operator and helper. This is because

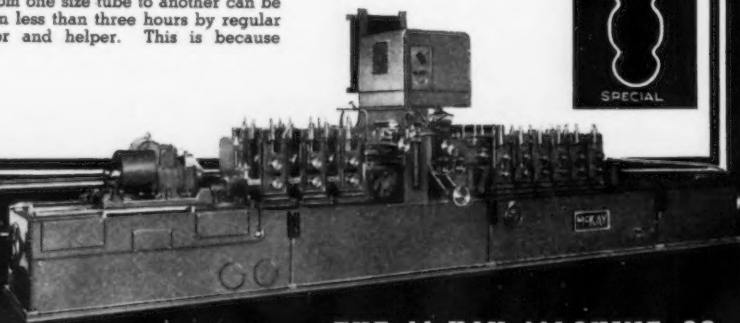
McKay construction includes enough auxiliary equipment so that units may be interchanged without disturbing vital settings.

McKAY "McKROMETER" ROLL PRESSURE ADJUSTMENT: (Covered by U. S. Patent 2,122,615). Allows actual recording of correct pressure settings at each pass for each diameter and gauge tube.

HIGH SPEED WELDING: Latest type high speed electric resistance welder, developed by welding engineers, gives highest speeds consistent with quality of product and economical welding method.

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The above represents only a few of the advantages of McKay equipment. Call on us for complete information, samples and demonstration.



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Capacity is ample for present requirements and, although the urge to decentralize plants is still strong, there are no present indications of important expansions during 1940.

Many Labor Problems

Since 1936 labor troubles have been many, and fundamental disturbances still exist. Major stumbling block to labor peace is a continued instability of contractual relationships between the CIO and management. In addition, demands from the unions increase, rather than decrease.

Wage demands have been almost incidental in most collective bargaining attempts in the past year, but have proved costly, nevertheless. An even greater threat to costs of manufacture—and a deeper threat to the control of manufacture—lies in the attempt of the CIO to gain control of production by the joint paths of regulating the rate of production and by control of employment through the closed shop mechanism. Both of these attempts have been resisted as infringing the rights and duties of management.

These points will be at issue again in 1940, along with the question whether foremen shall be organized into CIO unions, and demands for vacations with pay, a step toward annual wage plans, enforced use of the union label and the check-off.

The number of "wildcat" strikes has been reduced, but during 1939 the slow-down, blood brother of the sit-down, made an important appearance. Rejection by the State of Michigan of claims by unemployed in the big Chrysler strike probably sounded the death knell for the slow-down, however. There is now an active search for a formula that will make possible the settlement of disputes without strikes or violence. The CIO asserts that recent changes in grievance procedure are steps in this direction.

Last year saw the return of Homer Martin to the AFL, which he once left to lead his followers into the CIO. His remaining strength, as president of the International UAW-AFL, probably will be used this year in a war with the CIO for control of the auto workers. Strength of the AFL is doubtful, but the battle may be one of the features of 1940 labor history in that industry.

MISCELLANEOUS

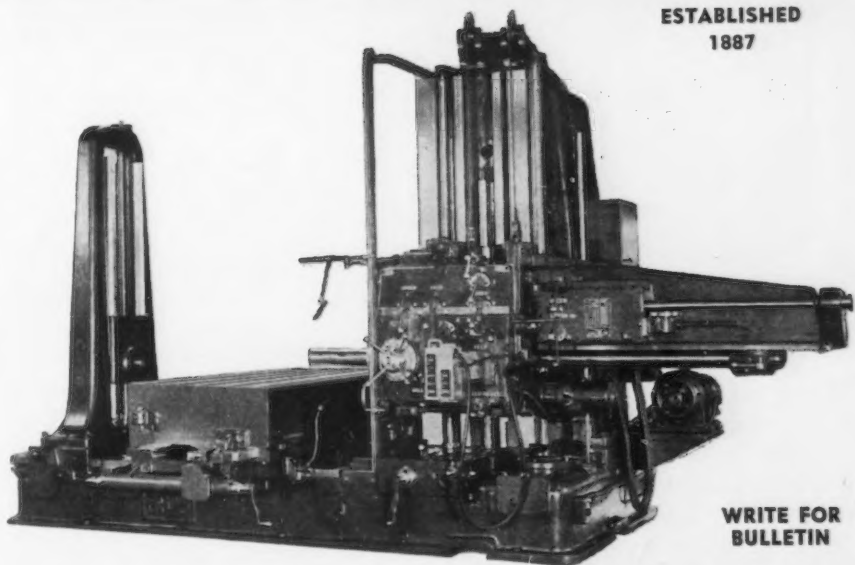
THE so-called miscellaneous consumers of steel embrace so many different lines of manufacture that their prospective requirements of steel can never be so easily estimated, even by the steel companies themselves, as the requirements of such consuming channels as construction, automobile manufacture, the railroads, shipbuilding, etc.

Participating in the rush for steel during September and October were many manufacturers whose products would not normally be in seasonal demand. Yet these manufacturers were flooded with an out-of-season demand for their products and in turn had to buy steel in quantities that normally would not have been required at that particular time of the year.

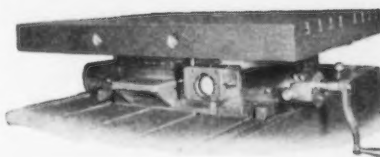
It is with regard to the miscellaneous steel consumers that doubts have

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arisen as to possibility of considerable over-buying of steel during the past few months. Investigation has disclosed that many of these manufacturers became extremely busy, but factual data are lacking in many instances as to the extent to which these articles manufactured of steel have passed into the hands of the ultimate consumers. The new few months probably will tell the story.

So long as the trend of employment and payrolls is upward and so long as consumer buying power exerts itself in the direction of improvement, many of the miscellaneous industries will continue to thrive. Some of these lines, however, are more quickly affected by a change in the wind than the long-term consumers, such as the construction industry and the railroads.

CONSTRUCTION

By W. A. PHAIR

THE improvement in construction activity, which first became noticeable toward the close of 1938, continued through 1939 without notable change in pace. Contracts for new construction, both public and private, placed in the past year totaled about \$3,355,000,000, according to the F. W. Dodge Corp., or about 5 per cent above 1938. It is predicted by that organization that the 1940 volume will be about \$3,580,000,000, or roughly 5 per cent above the 1939 total.

Public construction during the year was a little more than 10 per cent below the 1938 volume, as funds allotted under the 1938 PWA program slowly petered out. For the year as a whole, public funds accounted for 45 per cent of all the monies spent for new construction, as compared with 53 per cent in 1938. Although no additional funds have been appropriated for PWA work since the 1938 program, a large number of the projects authorized under that program are not yet completed. Out of a total of 6158 projects involved in that program, about 75 per cent in number have been completed. These, however, represent only 27 per cent of the total cost of that program, or \$388,719,000, leaving projects with a value of \$1,050,981,000 still in the construction stage. There are still six projects, costing \$1,673,000, for which funds have been approved but which are not yet in the construction stage.

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MAGNUS CLEANERS

These six projects will probably be the only PWA contribution to the 1940 construction volume.

Accompanying the rise in business activity in this country in the past year was a long delayed expansion in privately-financed construction. For the entire year, approximately \$1,850,000,000 was spent in this classification. Anticipating an increase of the same proportion in 1940, privately financed construction should pass the \$2,000,000,000 mark.

The largest gain in the privately-financed, non-residential, group was in manufacturing buildings, which advanced 40 per cent in dollar volume over 1938. Following this class came commercial buildings with a 16 per cent increase. In the residential category, the construction of apartments and hotels gained 63 per cent and one- and two-family houses increased 29 per cent.

War Causes Some Building

Already the warfare in Europe has been responsible for some plant expansion in this country, notably in the aircraft industry, but thus far the expenditures involved in this direction represent a very small portion of the annual construction volume. Should America become embroiled in the war, impetus will likely be given to the expansion of manufacturing facilities as industry became geared up to wartime demands. Yet, so much emphasis has been placed on the disastrous over-expansion of the World War years, that most industrial executives would demand much more than a few war orders before digging into surplus to provide additional plant capacity.

The dominant war motif, however, has had one definite effect upon the construction industry. It has caused a large scale program of non-civilian operations to be undertaken by the War Department in the form of defense structures. While funds allotted for this purpose at present are not especially imposing, it is probable that Congress will make additional appropriations in the present year.

Considering the actual steel involved in the past year's construction activity, as against the dollar volume considered previously, the picture is little changed except that the percentage going into public projects is greater than that being taken by private projects. In the past year, public programs absorbed 57 per cent of all structural steel, as compared with 59 per cent in 1938. According to present indications, there will be no important change in this figure in 1940. The spread between the dollar volume and tonnage volume accounted for by pub-



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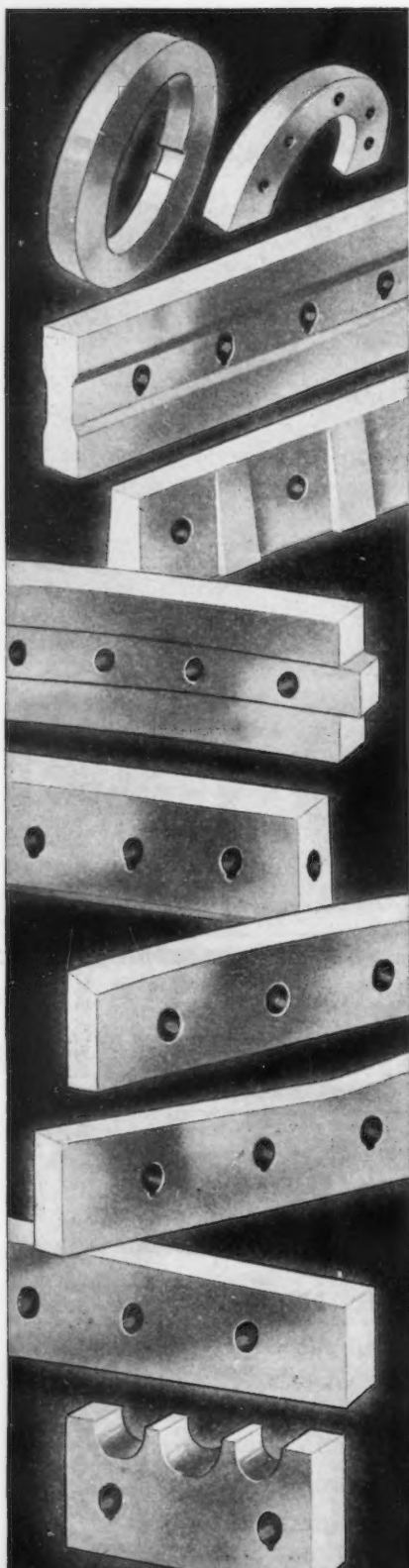
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lic construction is due to the nature of the projects undertaken with public funds. Home and apartment buildings, which accounted for a large share of the past year's gain take relatively little steel.

Bookings of structural steel in 1939 were about 1,325,000 tons, based on data issued by the American Institute of Steel Construction, as compared with 1,256,639 tons in 1938, or a gain of 5 per cent. Judging from factors now visible, bookings in 1940 will be about 5 or 6 per cent above the 1939 figure.

Highway Construction Greater

Highway construction, an important outlet for steel, increased over 11 per cent on the basis of number of miles of highway built, and ambitious plans are under way for 1940. The magnitude of the new programs under consideration, all of which are intimately associated with national defense plans, is indicated by the proposal of the Bu-

reau of Public Roads that a system of direct interregional highways be built involving about 30,000 miles of highway construction.

Expenditures by both Federal and State authorities for highway work in the fiscal year ended June 30, 1939, totaled \$336,091,256. This figure includes the necessary grade separations, elimination of railroad crossings, etc. Expenditures in the current fiscal year will probably be close to \$400,000,000, exclusive of appropriations already made for the building of a highway across the Isthmus of Panama at a cost of \$1,500,000.

Working from past investigations by various Federal bureaus, it appears that of all the sums to be spent for highway construction in the 1940 fiscal year, about \$22,960,000 will be spent directly for iron and steel products. Continuing on the basis of an expenditure of \$400,000,000 in the present fiscal year, iron and steel requirements will exceed 300,000 tons.

AGRICULTURE

• • •

By ROBERT G. BINGHAM

• • •

OUTSTANDING in agricultural machinery during 1939 were the continued development and use of the small farm tractor and the small combine.

From the time of its introduction in April, 1938, by Allis-Chalmers Mfg., the small tractor, designed originally for use on farms of under 80 acres, has literally swept the field. The largest tractor makers—International Harvester, Allis-Chalmers, and John Deere, as well as the Ford Motor Co. and Cleveland Tractor—are in production on small models, all selling around \$500 with rubber tires. Of the 6,800,000 farms in this country, 42 per cent, or 2,884,000 are between 20 and 99 acres, and constitute the major market for the small tractors. Before the new models were available, the power requirements of these farmers did not justify investment in the cheapest tractor then offered, but now the new one-plow tractors are usually able to provide all the power needed at a cost in line with the size of the farm.

A large market is developing also

with the increasing sale of small tractors for use as auxiliary power units on large farms.

Production and sales figures are not yet available for these small tractors, but one large company estimates its production of these models at 15 to 25 per cent by units of its total tractor sales. Medium and large tractors to date are still accounting for the bulk of the business, the all-purpose type dominating sales of all tractors, large and small, to the extent of 83.2 per cent in 1938.

Early in 1939, it was estimated that United States farmers owned 1,625,820 tractors of all types, the national average being 395 tractors per 1000 farms of more than 50 acres. Of these, Harry G. Davis, director of research, Farm Equipment Institute, estimates that about 50 per cent were purchased prior to April, 1932. Higher unit sales are expected over the next few years, but dollar volume may not increase commensurately because of an increasing proportion of sales of smaller and lower priced tractors.

Steel producers will be interested in

the fact that the average small tractor contains about 600 lb. of steel, while the medium and large tractors require from 1000 to 1500 lb.

The trend toward rubber tires on tractors continues, about 65 per cent of the 1938 output of wheel tractors being so equipped. The 1939 percentage probably will be still higher.

The farm tools sold for use with tractors and horses also are large steel consuming items, and amounted to 35.6 per cent of the total industry sales in 1938. Of these tools, great interest is being shown in the small combine, the various types of which cut swaths from 3½ to 6 ft. in width. In this field, Allis-Chalmers again pioneered, the first small combine coming out in 1935. Each year since then, the industry sales of this product have doubled, and sales prospects remain exceedingly bright. In 1938, harvesting equipment alone accounted for 12.9 per cent of all farm equipment sales, including tractors.

The 2,884,000 small farms are the target for small combine sales promotion, as they are for the little tractor. Combines formerly were of such size that only large farms in the central plains, Pacific Northwest, and soybean districts could economically justify their purchase. Today, however, the low acreage farm in the East, South and Middle West can harvest at a low cost by using the new combines. The small tractor and combine when employed with other specially designed tools, enable the average farmer of less than 100 acres to farm as economically and as easily as is possible today. The prospective market for this small combine has scarcely been touched.

Sales of the farm equipment industry vary directly with farm cash income. Sales in 1938, including export, totaled about 482 millions, as compared with 1937's all-time high of 571 millions. The latest estimate on 1939 farm cash income is 8.3 billions as against 8.0 billions in 1938. Government payments account for practically all of this increase, Federal money to farmers in 10 months of 1939 amounting to 640 millions compared with only 395 millions in the same period of 1938. Sales of farm products actually declined in the 1939 10-month period compared with the previous year. In spite of the prospects for an overall increase in farm income, early estimates indicate a 10 to 12 per cent drop in 1939 farm equipment sales compared with 1938, but 1940 sales are expected to gain 10 to 15 per cent over those of 1939.

The trend of 1940 prices is difficult



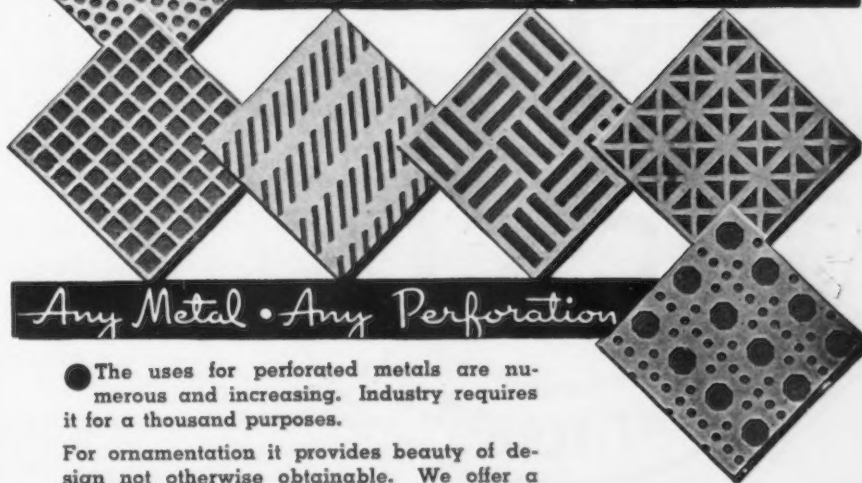
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to predict because of the European war and domestic crop conditions. An excessive lack of moisture throughout the corn and wheat belt in the latter half of 1939 may influence prices in 1940, although surplus corn and wheat stocks are high at present. The Department of Agriculture believes 1940 farm income will be higher than last year, with the chief increase coming from sales of perishables, such as livestock, dairy products, etc., rather than from grains. Government payments are expected to continue at about the 1939 level.

In spite of the great need for high production of foodstuffs in foreign countries, because of the large number of men under arms who must be fed, it does not appear that export sales of agricultural machinery will gain as a result of the situation. Import restrictions generally, and particularly in Australia, are important factors, as is the news that about half of Argentina's wheat crop has been lost because of bad weather. This latter misfortune, however, may react to the benefit of American wheat farmers in their foreign dealings.

At the close of 1939, farm equip-

ment plants throughout the Middle West were working at near capacity, filling orders from dealers for spring

delivery. Continued high production through the first quarter at least is predicted.

OIL AND GAS

By T. C. CAMPBELL

EVEN without the influence of the European war and the improvement in general business conditions, a moderate increase in oil country goods demand had been anticipated for 1940. Purchases during the first seven or eight months of 1939 by oil companies were kept at a minimum, and inventories of drill pipe used up as far as possible. The upsurge in demand beginning in August and intensified in September and October caught many oil companies without adequate stocks. The larger ones

immediately place orders for as much as 90 days ahead.

A windfall of business from South America to replace orders previously placed with Germany fell into the laps of American pipe makers. For the duration of the war, at least, this business will continue to come here.

With general business activity expected to hold at a fairly high rate at least through a portion of 1940, plus potential war demands for oil, oil country pipe requirements probably will increase moderately over those of

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1939. Estimates of the probable increase in tonnage range from 10 to 20 per cent.

It is not so much the demand for more oil that causes an increase in demand for casing and drill pipe; there are enough wells in operation to supply almost all of the needs that may arise if prorations were taken off. What happens is that a stronger crude oil price structure brings "wildcatters" or independent oil companies back into the scene. When they drill one well, chances are that five or more wells must be drilled by a major oil producer owning adjacent leases in order to protect the oil underground. The higher the crude oil price goes, the more "wildcat" and independent wells will be drilled, and hence the more will major producers be obliged to drill in order to protect their operations. This means additional pipe.

While casing and drill pipe are expected to show moderate increases in 1940, more important will be the continuance of rehabilitation work on oil refineries. This began in 1939 and probably will be even more intensive in 1940. While the tonnage of steel

required for such work is not large, it requires exceptionally high grade tubing and is an important outlet for this type of steel.

The pickup in business conditions which began last August probably served as an impetus in bringing to a contract stake many pipe lines which otherwise might have been held over. Line pipe tonnage is an in-and-out proposition, however, and defies prognostication. The chances are, however, that 1940 will be a better year for lateral line pipe than for regular or major line pipe. There are many

major lines from which lateral lines will be built.

If the war is prolonged, it is obvious that the Allies and many neutral countries will eventually need oil, though the demand thus far has not been as large as was expected when war broke out.

No unusual demand in 1940 is expected from gas companies. There may be some increase, however, as a result of improvement in general business conditions and the construction of many new dwellings throughout the country.

RAILROADS

B ESET on one hand by intensified competition from both highway and waterway users and by many still unsolved fiscal problems, and, on the other hand, by an unprecedented increase in traffic volume, 1939 was a disturbing year for the railroads.

Years of depressions, which heaped operating deficit upon deficit, wrought havoc with the carriers' replacement and maintenance programs, and as industrial operations last year slowly crept up and a war psychology gripped the world, many fears were expressed that the roads would not be

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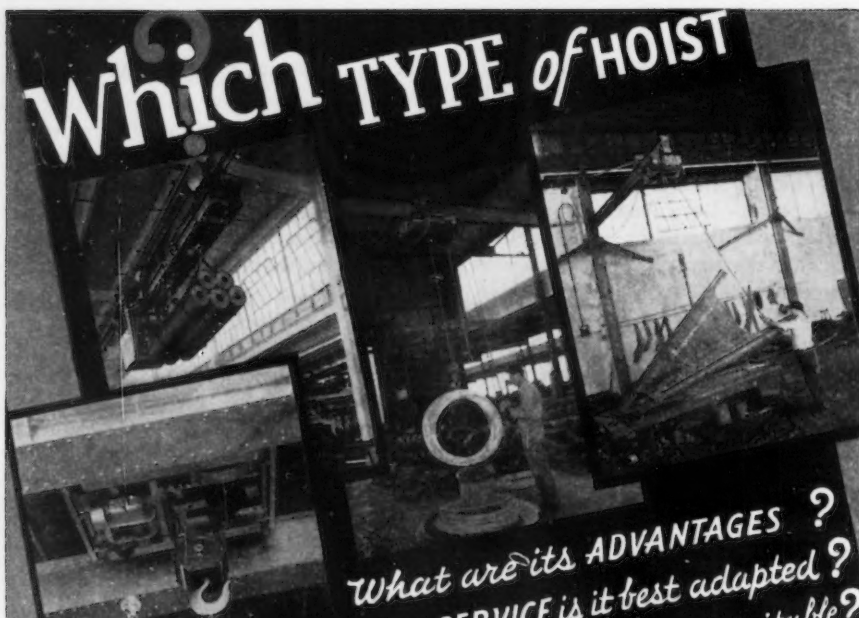
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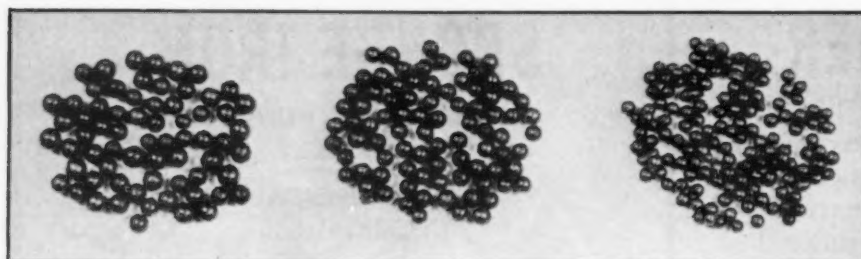
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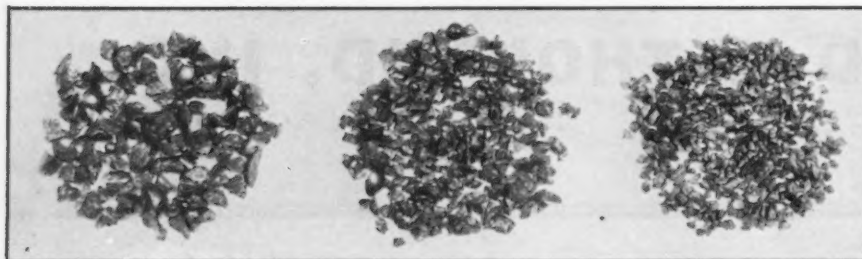
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able to provide adequate transportation facilities should America's participation in a European war be heaped upon a high rate of domestic industrial activity.

During the early part of 1939 carloadings were on a very modest scale, slightly above the 1938 average. In early April weekly carloadings were just below the 540,000-car mark. By the first week of September they had risen to 720,000 cars, and in the week of Oct. 23, 861,198 cars of freight were loaded, the highest number since November, 1930. This precipitous increase in traffic taxed the roads severely, but they apparently were equal to the task, despite the fact that the increase was almost double that previously estimated by the carriers as the limit they could handle with existing equipment.

With the climb in carloadings came a rush of buying of new rolling stock, motive power and rails. From January to August, 10,000 freight cars had been bought. In mid-September, the roads announced a new equipment buying and modernization program involving close to \$170,000,000, and by the end of November had ordered 47,752 additional cars. By the close of the year another 1500 cars had been ordered, bringing the total for the entire year to around 60,000 cars, as compared with 16,500 in 1938. In the period from 1931 to 1939, this volume was surpassed in only one year, 1936. The steel (rolled and cast) required to build these cars will amount to about 750,000 tons.

Heavy Rail Purchases

Along with the heavy car buying, came an equally intense demand for trackwork. Rails ordered between Jan. 1 and Aug. 31 totaled 730,000 tons. Between Sept. 1 and the end of the year an additional 1,000,000 tons had been allocated, bringing the total for the year to 1,730,000 tons. This figure compares with 349,000 tons purchased in 1938.

The trackwork buying of the past year, together with the steel requirements of the freight car purchases, indicates that close to 2,500,000 tons of steel will be needed to take care of the railroad buying of 1939. A large part of this tonnage, particularly the rails, will not be rolled until this spring and will undoubtedly be an important factor in stabilizing steel industry operations through the first six months of 1940.

Further indications that railroad buying in 1940 may provide important support for steel mill operations is contained in the announcement by the Reconstruction Finance Corp. that while conditional commitments for equipment purchases totaling \$60,000,-

000 had been made by that agency in September, October and November, final loan arrangements had been made for only one-half that sum, leaving a cushion of about \$30,000,000 worth of equipment purchases which will probably be made early this year.

The buying of rails in 1939, while high in comparison with practice over the past 10 years, broke no records. In the period from 1922-30, the average yearly purchase was 1,700,000 tons. Unquestionably, much of the rail tonnage allocated last fall would normally have been placed this spring. Hence it is unlikely that any new buying program of similar size will materialize in the first half of this year, unless business conditions show promise of maintaining the accelerated pace of the last quarter of 1939, or unless this country is drawn into war.

In view of the discrepancy between car retirement and new purchases over the past 12 years, at least 100,000 cars would have to be purchased annually for some years to come, if the railroads are to handle a sustained volume of 800,000 cars a week. In 1939, the average weekly loading was approximately 660,000 cars; in 1937 it was

724,000 cars and in 1929 was 1,016,000 cars.

The sounds of war drums in Europe have revived memories of Government operation of the carriers in 1918 and serious consideration is being given to the possibility that Federal control might be expected again in the event of a war. There is no question that many left wingers of the present Administration would eagerly grasp at wartime requirements as justification for achieving an end long sought for—the socialization of the railroads. Yet, remembrance of the costliness

and inefficiency of Government operation in the World War would be a difficult obstacle to overcome.

But war or not, if the railroads are to embark upon a program of adequate replacement and maintenance, there must be some solution to the fiscal problems facing the roads. Until this problem is resolved, and as yet there has appeared no signs of a rapprochement of the two dominant schools of thought on that subject, the railroads cannot assume the position they held previous to 1929 as steel's fourth largest customer.

SHIP BUILDING

AFTER many long years of empty ways, the shipbuilding industry in 1939 found itself in a position where if it were to take care of existing naval and commercial demands it would be necessary to revive long defunct yards. The prime factor

in this spurt in activity was the Maritime Commission's program, announced in 1938, which contemplates the construction of 500 ships over a 10-year period.

The commission's program went ahead very rapidly in 1939, with the

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placing of contracts for 91 boats costing \$220,000,000. These ships will require about 317,000 tons of steel.

The ships ordered for in the past year bring to 141 the number contracted for in the two years of the commission's existence. The contract value of these 141 boats is \$340,000,000 and total steel requirements are 511,980 tons. Present plans call for the purchase of four passenger liners and five other ships of undetermined

type in 1940 at a cost unofficially estimated at \$75,000,000.

A breakdown of contracts placed in 1938-39 shows the following distribution as to type: Tankers, 12; C-1 cargo, 38; C-2 cargo, 40; C-3 cargo, 22; C-3 passenger-cargo, 11; cargo 14; passenger-cargo, 3, and one liner.

The total value of contracts placed by commission in the past two years, the bulk of which was awarded in 1939, with the larger shipbuilders are

as follows: Bethlehem Steel Co., \$71,159,000; Federal Shipbuilding & Dry Dock Co., \$62,548,000; Sun Shipbuilding & Dry Dock Co., \$63,614,000, and Newport News Shipbuilding & Dry Dock Co., \$54,130,000 (includes the liner *America*).

Naval Program Forges Ahead

The naval shipbuilding program also forged ahead in 1939, with contracts awarded for three battleships, one aircraft carrier, four light cruisers, eight submarines, eight destroyers, two sea-plane tenders, one mine layer and one repair ship. Approximately 72,800 tons of plain steel and 48,000 tons of armor plate will be used in building these ships.

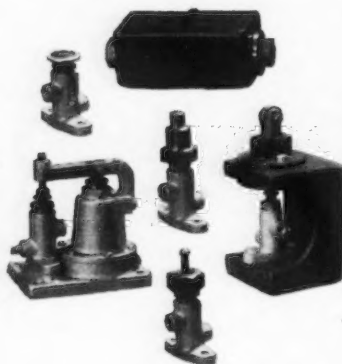
The extended construction periods involved in building a naval vessel, ranging from two years for a destroyer to four years for a battleship, will spread the effect of the Navy program on industry over a considerable period of time and very likely some of the steel and machinery required for boats contracted for in 1939 will not be actually ordered from the steel mill or machinery maker until late in 1940 and possibly not until 1941. As a matter of record, the keels for many boats awarded in June have not yet been laid.

Appropriations for new naval construction for the fiscal year ending June, 1940, total \$253,604,712. The trend of events abroad has given new strength to efforts to develop the U. S. Navy to its proper strength and it is not improbable that the 1941 Naval Appropriation Act will call for expenditures double those of 1940.

Probably the chief limiting factor to any program undertaken by the Navy will be the capabilities of existing active ship yards to handle additional work. Both the Navy Department and the Maritime Commission have made extensive studies of the subject and efforts will be made to obtain Government assistance to put defunct yards back into use. The Vinson naval bill now pending would permit the Navy to advance 30 per cent of the contract price in cases where adequate security is given.

While the revised Neutrality Act should theoretically tend to reduce the construction of merchant ships, it is doubtful if this will actually occur. The merchant fleet is looked upon as the backbone of the Navy and a merchant marine unable to properly service the Navy in time of emergency would nullify the effectiveness of any naval construction program undertaken.

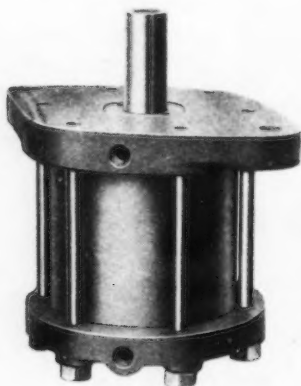
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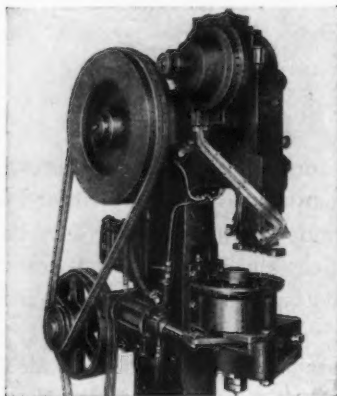


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Aviation

MOST pertinent question about the aircraft industry today is whether its current programs for military plane manufacture represent an over-expansion of plant facilities, production equipment and personnel in both the airplane and engine divisions of the industry.

Secrecy imposed by military authorities makes statistical information about the boom in aircraft business very sketchy, but available figures are truly astronomical in their proportions. Data have been examined which show an industry backlog of approximately \$400,000,000, with orders growing on company books. At least a trio of important companies is not represented on the list which makes the foregoing total. Up-to-date dollar-volume of backlogs contrasts sharply with an approximate \$150,000,000 in backlogs a year ago.

While the ending of the war will probably bring a cessation of large foreign airplane orders, it is not likely that there will be such a sharp drop as occurred at the end of the World War because many of the foreign contracts, if not all, are non-cancellable. Moreover, a large part of the orders on the books of airplane companies are for the United States Government and will not be cancelled. In addition, there are the growing requirements of commercial aviation companies to be considered.

In effect, a backlog of demand exists for private, commercial and transport airplanes, and factories will turn more attention to satisfying this demand when the flow of war orders stops. There will be a readjustment period, but it will be shortened by the existence of a peacetime market already developed to some extent.

More Pilots Being Trained

Thus in the period July, 1938, to July, 1939, the number of pilots in the United States increased 30 per cent, or 6000, bringing the total to 26,144. The normal curve of increase indicates that there would be 36,000 pilots by the end of 1940, and 43,000 by the end of 1941. Taking into account those to be trained under the Civil Aeronautics Authority program, the numbers ought to increase to 70,000 by the end of 1941. Besides expanded Army and Navy training programs, each adding thousands of pilots every year, the CAA

program calls for the instruction of 11,000 college students in the school year 1939-40, after successful testing of such program last year. Graduates of this course obtain private flying licenses.

Air transport made gains up to 50 per cent in passenger business during

the summer months of 1939, and between 35 and 40 per cent in the fall. Domestic airlines have not been expanded greatly in mileage, but planes are being added to service as fast as manufacturers can fill transport orders. A start was made in trans-Atlantic air service during the last year, although war has tended to interfere. However, Pan-American Airways in early fall experienced a 100

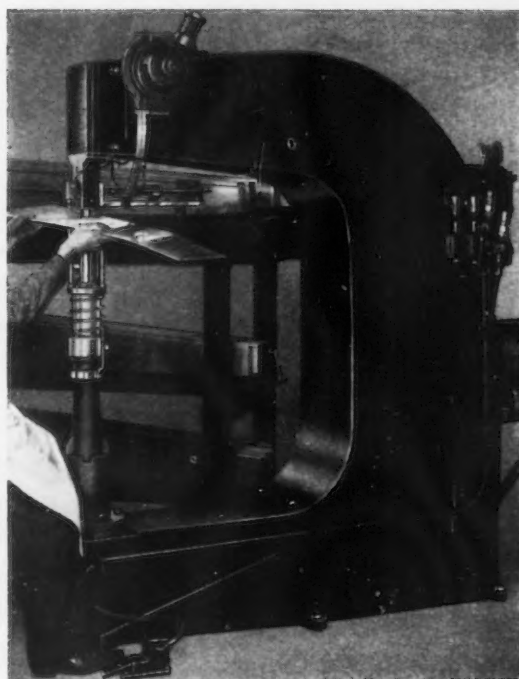
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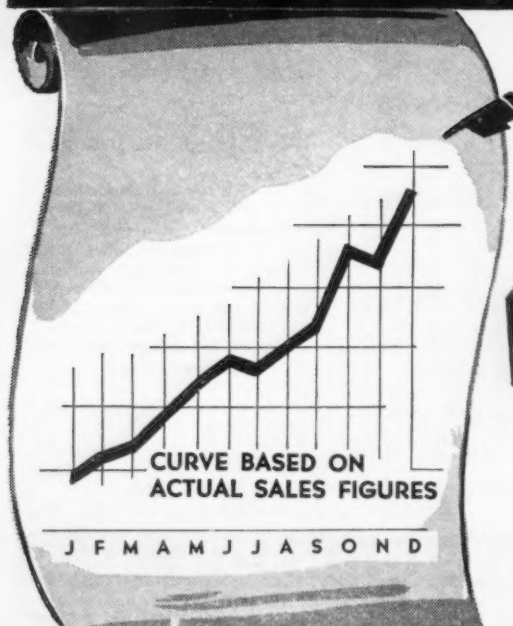
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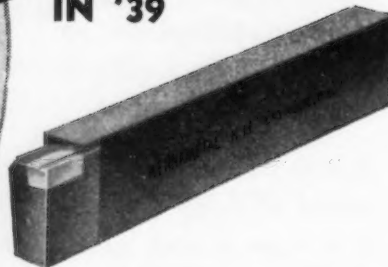
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per cent gain in South American travel.

Although many technical advances were made by aviation in the last year, and more aerodynamic achievements are ahead, one of the most spectacular in the eyes of the metal-working world probably will be the introduction of the "plastic" airplane. Half a dozen organizations are behind such efforts, which will make use of laminated plywood, impregnated with a substance similar to bakelite, formed to desired shapes under heat and pressure, then assembled.

25,000 a Year the Goal

Condition of the industry's physical assets is indicated by a recent summary issued by the Aeronautical Chamber of Commerce of America. This sets the current rate of production of airplanes at a maximum of 1250 a month, or 15,000 a year; by the end of 1940 it will be able to produce at a rate corresponding to the output of 25,000 planes annually. Airplane manufacturing space increased 17 per cent to 7,025,000 sq. ft. during the first six months of 1939, and substantial increases in buildings are now being added or planned.

Engine capacity now is rated at 16,000 units a year, but by Dec. 1, 1940, those companies which have been producing high-powered motors will have an annual productive capacity of 25,000 engines of at least 1000 hp. each. Other companies will supply the smaller engines used in training planes and private planes, for which requirements now exceed 3000 a year in all classifications. Engine manufacturers added 20 per cent to factory floor space in the first six months of last year, and 32 per cent in the 18 months ended July 1, 1939. Since July of last year they have contracted for more floor space at an even faster rate.

Straight-line production methods, organized building of sub-assemblies and the sub-contracting of parts have increased under the pressure of expanded requirements. Standardization has been improved by volume orders, such as one for 1000 pursuit planes of a single basic type. Manufacturing methods and tooling are undergoing important evolution. The industry is making greater use of skilled men; having reached the point in all skilled lines of work where extensive scouting expeditions around the country are not producing enough men, the industry is engaged in several training programs to develop the skills it needs.

Emergency Powers Threaten Industry

(CONTINUED FROM PAGE 81)

As finally enacted and proclaimed by the President the law prohibits American vessels from calling at ports in the English Channel, the Baltic and North seas, French territory in the Mediterranean and a strip of the eastern Atlantic stretching from a point just below Bergen, Norway, to the Bay of Biscay in Spain. Although Canada is a belligerent, shipping from United States Atlantic ports is not barred to Canadian ports on the Bay of Fundy, nor are there any restrictions on deliveries of goods by train or truck across the border or by way of the Great Lakes. Quick moving developments extending war operations and blockades may well mean that additional areas will be barred to American shipping and commerce by Presidential proclamation.

The law forced the struggling American merchant fleet to lay up 88 vessels, though some have been re-commissioned and diverted to new routes, permitting reemployment of a portion of the 6000 seamen who had been made idle. The ships were driven from a trade that produces an annual revenue of \$52,500,000. Lay-up costs for a year were estimated at \$4,200,000. The act compelled the relinquishing of a lucrative European trade to rivals and a check on exports and imports. Withdrawal of American ships saw goods for export piled up at docks and wharves, trade with neutrals as well as belligerents disorganized. Shortage of vessels saw freight rates turn upward sharply, following the course of war risk insurance.

A specific administration plan, however, may develop from a suggestion made by Joseph P. Kennedy, ambassador to Great Britain. Kennedy went to Washington on Dec. 8 and discussed with the President and Maritime Commission officials plans for using idle American vessels on British trade routes outside of war zones. Kennedy said that the use of American ships on these routes would necessitate talks with the British. He added that the Maritime Commission is still looking up the specific routes on which American ships might be used. The suggestion looks to the putting of American ships in service from which, due to the war, British vessels have been withdrawn either partially or entirely. It is stated that the Maritime Commission thinks that the British would be loath to give up any part of shipping service except where it had been

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necessary to withdraw. Both President Roosevelt and Kennedy said that no proposals involving the taking over of idle American ships by the British were under consideration. The President said he had discussed with the ambassador the matter of using American ships on neutral trade routes and the possibility of shipping southern yellow pine to countries cut off from their normal lumber supplies.

Among members of Congress is a group who think the way out is for

American shipowners to sell their vessels outright and replace them with new ships, some for operation in connection with increased neutral trade, especially with Latin America and much of Africa and for unrestricted use after the war.

The Neutrality Act makes it unlawful "for any person to purchase, sell or exchange bonds, securities, or other obligations of the government of any belligerent state," named in proclamations issued under the act, "or of any

political subdivision * * * or to make any loan or extend credit * * * for any such government." The act, however, specifically excepts those transactions consisting of the renewal of adjustments of indebtedness existing on the date of proclamation. Discretionary power also is given to the President to except ordinary commercial credits and short time obligations of a character customarily used in normal peace-time commercial transactions. This authority may be exercised by the President when he finds that commercial or other interests of the United States or its citizens will be protected.

Technical Violations Denied

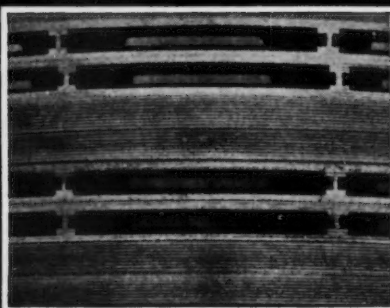
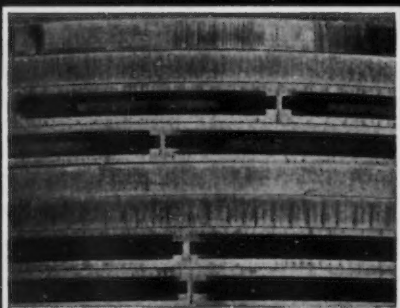
Vigorous denial is made by Administration officials that the act is violated in the procedure under which Allied orders in the United States are to be paid for through Federal Reserve banks. The plan does not provide for credits. Government officials say it has a three-fold purpose: (1) The Government is kept informed on orders, including those of a non-military type which do not require licenses; (2) advantage of personal market transactions is automatically barred to private bank employees; (3) private banks are assured against danger of an inadvertent error.

Discussions centering around reported loopholes in the act recall the comment of Senator Tom Connally, Democrat, of Texas, one of its authors. Although the law requires that all shipments must be paid for before leaving the United States, the Senator has said this is only a bookkeeping transaction for corporations with incorporated subsidiaries in belligerent countries. Such subsidiaries, it has been pointed out, can also extend credits to belligerent countries, though their American parent corporations are forbidden to do so.

Consideration also is being given to another alleged loophole, by which, it is contended, an individual exporter can, upon assumption of risk incident to the transfer of title, extend credit to an individual buyer in a belligerent country of goods not coming within the classification of "arms, ammunition and implements of war."

But whatever the major or minor defects of the act are, it has popular public approval. The public thinks it is the right approach to keeping out of the war and keeping out of the war is the predominant desire. The end

This Shows How



THERMOIL-GRANODINE REDUCES WEAR

Notice that the untreated piston rings pictured at the left above are worn and scuffed vertically, while the THERMOIL-GRANODIZED rings at the right (GRANOSEAL RINGS made by the Sealed Power Corporation) still retain the original horizontal machine-marks of the maker. Yet both sets of rings were tested simultaneously in the same engine. Wear on the GRANOSEAL RINGS was only one-fifth as much as that on the untreated rings.

This exemplifies the wear-reducing effect of the THERMOIL-GRANODINE coating on ferrous surfaces subjected to friction. Almost all moving machine parts can be successfully treated—gears, pistons, tappets, valves, camshafts, spiders, etc.—as well as tools, nuts, bolts, and other products requiring protection against rust.

Write for Bulletin



A MERICAN **C** HEMICAL **P** AINT **C** O.
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rather than the means is therefore the object in view. Hence repeal of the act or broad revision in order to return to the American traditional policy of international rights seems improbable. Such a move, however, may be attempted in the Senate by a group who insist that the Neutrality act represents the greatest surrender of American rights on the high seas since Jefferson's disastrous embargo act. But the restrictions on American shipping whether too severe or not reflect public fear of placing too much power in the hands of the Chief Executive.

Uncle Shines His Armor

(CONTINUED FROM PAGE 84)

way in a statement to the Senate Committee on Education and Labor:

"The bidding on steel, while the minimum-wage determination was in effect, was confined to two bidders agreeing to the stipulations, and as only one of these could produce steel within the whole range required, the bidding was limited on some items to one bid. Bidding is now normal due to the temporary court injunction suspending this wage determination."

Moreover, Navy records show that bidding fell off markedly after passage of the Walsh-Healey Act, dropping from an average of 7.49 bids per lot in 1936 to 5.84 bids per lot in 1937, a drop of 25 per cent. The rate of bidding which existed prior to the law has never been regained.

Other Laws Impose Restrictions

Other major laws imposing labor conditions on contractors and raising questions of overlapping jurisdiction include the Eight Hour Law of 1912 with its provisions covering the employment of laborers or mechanics; the Bacon-Davis Act imposing prevailing wage standards on contractors and subcontractors in the construction and repair of Government buildings, public works, ships and aircraft; and the Federal Kick-Back Act of 1934, which is applicable to construction of public works and seeks to prevent employees under force or intimidation from giving up any part of their earnings.

Statutes imposing profits limitation on contractors and sub-contractors, including the Vinson-Trammell Act of 1934, the Merchant Marine Act of 1936 and the National Defense Act of 1939, put a 10 per cent profit limit on

Navy and Maritime Commission contracts and a 12 per cent limit on aircraft contracts awarded by either the War or Navy Department. Under Treasury Department ruling, manufacturers of equipment such as machine tools, where it is determined that the equipment is a part of the original requirement specified by the contract, have been held subject to the profits limitation by giving them a sub-contractor classification.

While the method for determining

the cost of performing contracts is fully covered in Treasury Department regulations, they did not originally contain provision for treatment of the cost of special equipment or facilities required by the contractor where the life of such equipment could not be charged against any particular contract. In the interest of relaxing the limitation on profits, the Navy asked Congress and was given permission in August, 1939, to dip into its 1940 ship-building funds and buy special heat

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*Write for Bulletin 13,
a treatise on pickling*

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treating equipment to be installed in plants having armor plate contracts. After the need for such additional equipment has passed, the Navy is authorized to lease, sell or scrap the special equipment.

Under this arrangement it is understood that the Government has completed negotiations with several firms which previously, recalling that they were left with idle plants after the World War, had been showing some reluctance to increase production facil-

ities to a point unwarranted under peace-time conditions.

"Red Tape" Partly Cut Out

In September the Treasury Department, recognizing the necessity of permitting manufacturers speedily to write off new plant and equipment purchases and prodded by War and Navy departments, announced it had revised its regulations. The amended plan embodied the machinery for entering into closing agreements for treating

the cost of new or enlarged facilities acquired by contractors in cases where the Army or Navy certified to the necessity in the interest of the defense program of installing special facilities, which later will become partially or totally useless after completion of the contract.

Even before the national defense program assumed the proportions it took last year, an exception was permitted to the ordinary Government purchasing procedure so that the Government could make open market purchases where immediate delivery or performance was required by public exigency. In addition to this exception, last year's defense program authorized by Congress exempted the \$32,000,000 educational orders program from the customary procedure with the result that the Secretary of War is authorized to place orders for munitions of special or technical design with such establishments as in the Secretary's judgment will be competent in time of war.

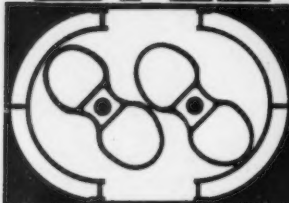
In order to become eligible for these orders, described by War Department officials as designed not to be sources of financial profit but merely as a means of learning how to manufacture armament, a company must be put under scrutiny by the War Department's Division of Procurement Planning, which investigates plant facilities, organization, financial structure, location and other factors. After approval by the President, the firm is then listed together with others entitled to bid on this classification of orders.

Other exceptions to the usual bidding procedure are made in the purchase of patented items procurable only from a controlled source, and in the purchase of aircraft on a competitive performance basis which was authorized under the Air Corps Act of July, 1926.

Obviously, under war-time conditions or during a declared emergency, the traditional Government buying restrictions can be scuttled or phases of the existing machinery can be maintained for operation jointly with the war-time procurement machinery.

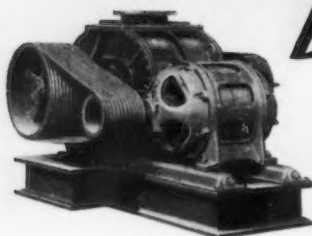
But no one who understands the War Department's and Navy Department's attitude with respect to purchases entertains any belief that labor restrictions on contracts would be retained during time of war. The Walsh-Healey and Federal Eight Hour laws and other restrictions which have nothing to do with protecting the Government against fraud or

SAFEGUARDS



for
OPERATING PROFITS

Blowers



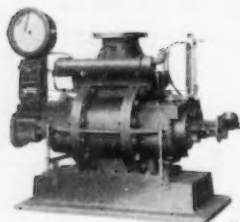
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injury would be promptly thrown overboard.

In fact some officials would like to do just that today. Under the circumstances, however, they are making the best of a badly-bungled Congressional job, convinced that the noose around Government contracts will be drawn no tighter while the armament program is in full swing and more particularly while the influence of organized labor is waning in the halls of Congress.

Steel Makes a New High

(CONTINUED FROM PAGE 96)

the corresponding period in 1938, Canada supplied 12,548 tons.

SCRAP EXPORTS BY PRINCIPAL COUNTRIES (Gross Tons)

	—10 Months Ended—	
	Oct., 1939	Oct., 1938
Japan	1,720,016	1,058,186
United Kingdom..	457,983	389,712
Italy	384,605	306,582
Canada	140,333	65,350
Poland	*147,596	124,302

*Shipments in September, month of German invasion, were 8919 tons. There were none in October.

Steel Exports Increase

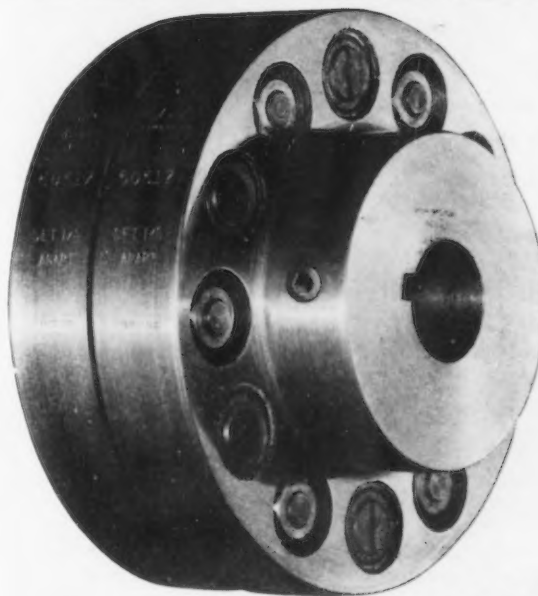
ALTHOUGH the upward movement in sales of iron and steel for export began in late August, shortly before the outbreak of hostilities, the large volume of sales did not manifest itself in outgoing shipments until October. The rise in exports that month was not large, but there was significance in relatively sharp gains to the United Kingdom and moderate increases to the West Indies and North, Central and South America, particularly Brazil. There was also an increase in shipments to South Africa. The total exports of iron and steel in October were 255,081 tons compared with 244,933 tons in September. The United Kingdom, not an important peace-time importer of American steel, took 74,632 tons in October compared with 51,879 tons in September. Removal of tariff duties by Great Britain was taken to indicate larger purchases in the United States.

Imports of steel have declined. While exports gained to 257,848 tons in the first 10 months of 1939 from

194,973 tons in the corresponding period of 1938, there was a sharp decrease in imports in October to 16,884 tons from 26,658 tons in September. The chief drop was in shipments from belligerent countries. Imports from Germany in October were negligible, amounting only to 129 tons against 1103 tons in September, and the latter figure was below that for any month of 1939 preceding the war. During the 10-month period of last year Germany ranked second as a source of American imports of steel, supplying

47,355 tons. April, with 20,191 tons was the peak month. Of the 1939 total of imports from Germany, 23,200 tons were seamless pipe and 10,122 tons were barbed wire. Imports from European neutrals such as Belgium, Luxemburg and Norway also dropped in October.

Exports in the first 10 months of 1939 totaled 1,772,068 tons, a decline of 14,068 tons from the corresponding period of 1938, but the upswing which started in October indicated that the full calendar year may have produced a total greater than the 12-months'



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Indianapolis, Ind.

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Los Angeles, Calif.
Louisville, Ky.
Milwaukee, Wis.
Minneapolis, Minn.

Montreal, Quebec
New York, N. Y.
Philadelphia, Penna.
Pittsburgh, Penna.
San Francisco, Calif.

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Spokane, Wash.
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total for 1938, which was 2,149,334 tons.

There was a decline in shipments to Japan, which in 1937 and 1938 took more American steel than any other country. In 10 months of last year Japan took only 129,199 tons of iron and steel against 438,652 tons in the corresponding period of 1938, yielding first place to Canada, which took 273,648 tons in 10 months of 1939 against 205,746 tons in the corresponding period of 1938. Brazil's liberalized ex-

change control is said to account for the gain made in iron and steel shipments to that country, which rose to 109,756 tons from 58,634 tons. A substantial increase was made in exports to the Netherlands, a large portion of the tonnage having been tin plate, other exports consisting chiefly of plates and sheets. Swedish imports of American steel rose almost 400 per cent to 103,672 tons from 21,023 tons and consisted principally of tin plate, sheets and plates.

Belgium maintained first place as an exporter of steel to the United States, shipping 70,537 tons in 10 months, mostly structural shapes.

Details of exports and imports by principal countries follow:

IRON AND STEEL EXPORTS BY PRINCIPAL COUNTRIES

	—10 Months Ended—	
	Oct., 1939	Oct., 1938
Canada	273,648	205,746
Japan	129,199	438,652
United Kingdom...	110,193	122,612
Brazil	109,756	58,634
Philippine Islands..	107,794	84,503
Sweden	103,672	21,023
Netherlands	91,453	62,017
Mexico	66,954	36,755
Venezuela	62,754	63,246
Colombia	55,731	46,279
Kwantung	54,495	92,593
Cuba	48,657	39,413
China	44,516	17,758
Union of S. Africa.	38,360	34,854
Chile	38,289	43,160
Russia	27,590	53,362
Argentina	22,792	24,813

IRON AND STEEL IMPORTS BY PRINCIPAL COUNTRIES

	—10 Months Ended—	
	Oct., 1939	Oct., 1938
Belgium	70,537	63,092
Germany	47,355	41,181
Canada	40,948	12,967
India	22,365	11,965
France	18,436	17,694
Sweden	18,823	12,397
Norway	16,936	11,374
Netherlands	15,119	16,618

Correction

IN a story "Accurate Evaluation of Jobs Necessary" in the November 23 issue of THE IRON AGE, it was stated that B. C. Gould, speaker before a meeting of the Detroit chapter of the Society for the Advancement of Management, had advocated a job-rating method which made use of the highest and lowest rate as initial points for the establishment of a scale. Mr. Gould calls our attention to the fact that he actually criticized this method for evaluating occupations since the accuracy of all rates must necessarily depend on the selection of these two rates. He pointed out that one of the unique advantages claimed for his plan was the fact that *all* rates are evaluated in relation to a common base which can be readily determined in different vicinities or industries.

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Non-Ferrous Metals

(CONTINUED FROM PAGE 100)

as an addition agent in their products, need have little anxiety at this time.

Mercury

Mercury or quicksilver is heavily imported and a notoriously speculative commodity. American production has been rising steadily, but normally imports constitute about half of requirements. The major producers outside of the United States are Italy and Spain with Mexico far behind even the United States. The average annual rate of consumption of mercury in the United States has been about 28,000 flasks. Reserves of American resources are said to be large, estimated at 163,000 flasks, exclusive of dumps. Although the cost of recovery is high, these reserves will undoubtedly be brought into production since the price has risen to high levels, now \$140 to \$148 per flask.

Metallic mercury is required by industry mainly for fulminate for detonating high explosives, electrical instruments, dental purposes, lamps, thermometers, etc. Other possibilities are well above the horizon, such as the mercury boiler and the mercury-arc rectifier. These consumers must expect considerable market activity and price fluctuation.

Tin

Even the schoolboy knows that tin is one of the leading indispensables and at the same time an outstanding lack. The country consumes more than one-third of the world's output and produces practically none. The only domestic source is secondary tin of which 21,080 tons was produced in 1938 and which had to be supplemented by the importation of 49,699 tons in the same year. According to the Bureau of Mines, the apparent consumption of new tin amounted to 49,699 tons in 1938. The main source of tin is British Malaya. Smaller sources include China and the Netherlands Indies.

In spite of the fact that this situation seems so extreme that nothing can be done about it, some measures are being taken. It has always been a

matter of dissatisfaction that America has no tin refineries. They have been tried in the past but the cost of production was found to be too high. Now, however, due to the dangers of marine transportation, Bolivia is diverting ores from European smelters to new plants being set up by the Phelps Dodge Corp. and the American Metal Co. in this country for refining their material. The output will, of course, be small at the beginning but

it seems that these plants will be self-sustaining, asking for no help in the form of subsidies, etc.

Nevertheless, the country will still be almost wholly dependent upon British tin. The market situation should be obvious to all tin users. An extended war will accentuate the shortage and force the price up. At the present time the London market is closed. This may offer an opportunity to the New York Commodity Ex-

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change to establish a really effective tin market in this country.

Tungsten

Tungsten is another strategic metal, highly susceptible to international complications.

Even before the European war, the hostilities in China caused prices to skyrocket since China is one of the leading sources of supply, having sent ores and concentrates containing

3,794,440 lb. of tungsten in 1937 out of a total of 5,561,022 lb. which we imported during that peak year from all sources. (In 1938, a very poor year, these figures fell to 69,986 and 162,744 respectively.) Another important source is British Malaya, which shipped 67,460 lb. in 1938.

This country's own shipments in 1938 amounted to about 3040 tons of concentrates of 60 per cent WO_3 , containing roughly about 2,900,000 lb. of

tungsten. Under pressure of war conditions, it would be possible to produce a total of 45,000 tons of concentrates from present known domestic resources, but this tonnage would come out only under the stimulus of very high prices.

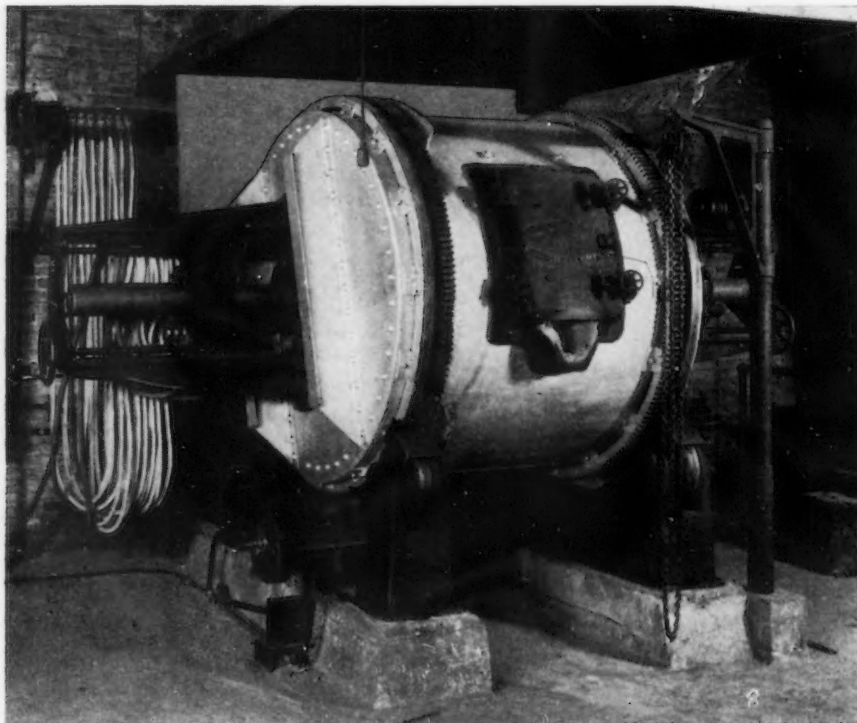
A glance at the list of principal uses of tungsten, the manufacture of high speed steels, cemented tungsten carbides, stellites and electric light and radio tube filaments, shows how vital this once rare metal has become to industry and the present standard of living. An interesting sidelight, however, is the fact that within the last few years molybdenum has risen in popularity as a constituent of high speed steels and is now used to replace a sizable part of the tungsten formerly contained therein.

Tungsten is a strategic metal but it is not in as tight a place as some of the others. Nevertheless, the prospects here are for firm and perhaps rising markets as some shortage may develop.

Cadmium

Cadmium, a very volatile commodity, presents another problem but of a different character. Here the difficulty lies not in the fact that it is imported in considerable quantities (828,535 lb. in 1937), but rather that its supply is limited by the method of production, primarily as a by-product metal in recovery of zinc. Total consumption in the United States during that year, 5,652,500 lb., set a new record, an increase of 17 per cent over 1936. This exceptional demand was met by a 13 per cent increase in domestic refinery production and a 44 per cent increase in imports. In 1938 it suffered an almost vertical decline in imports (22,582 lb.), consumption (3,748,000 lb.) and price (from a high of \$1.60 to \$2 per lb. to a low of 55c.). At the time of writing, the price has again risen to a good level, 75c. per lb., and spot metal is limited.

The first serious shortage of cadmium was caused several years ago when it became a constituent of automobile bearings. Although more recently stocks of cadmium-bearing flue dusts and similar products have been worked to increase production, the effect of a heightened war demand can hardly be guessed, let alone estimated. To be sure it is largely an American produced metal and with the help of



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higher zinc production under war pressure, cadmium will be forthcoming in considerably larger amounts. There is little doubt, however, that the prospect is for high price levels and that users will again begin to think of certain substitutes.

Platinum

In platinum resources the country is again a "have-not". In 1938 only 36,213 oz. of new platinum and allied metals from domestic sources was produced, whereas during the same year importation for consumption totaled 161,189 oz. for use in jewelry, dental alloys, electrical instruments and the chemical field.

Most of the new platinum metals imported by the United States come from the United Kingdom and U.S.S.R., but Colombia is a growing source. Outstanding is the phenomenal rise in Alaskan output, from 11,552 oz. of crude placer platinum in 1935, to 41,000 oz. in 1938.

In this group of metals the country is in no serious danger of being cut off.

Titanium

No reliable statistics are available regarding American production of the titanium minerals, ilmenite and rutile, but it is known that British India furnishes the bulk of the total world output of ilmenite. Domestic production in Virginia, Arkansas, and California is increasing but the country can still supply only a small proportion of its needs. Clearly, therefore, supplies are subject to the uncertainties of long sea trips.

The primary function of titanium in the metal industries, in the form of ferrotitanium with a titanium content of 15 to 40 per cent, is as a scavenger for oxygen and nitrogen in the production of steel. Rutile, the other important mineral, has had a phenomenal growth for use as welding rod coatings. It is produced in the United States, both for domestic use and for export.

The price situation is decidedly firm. Although no recent changes have been made, any movements which do occur will likely be upward.

Vanadium

The world supply of vanadium comes from a limited number of sources of which America is now the

leader. The next producers are southwest Africa, 557 tons of contained vanadium; northern Rhodesia, 374 tons; and Peru, 102 tons. America ranks first with 732 tons.

American production has recorded a striking increase but is still inadequate for domestic requirements so the country is forced to import the difference. Figures given by the U. S. Bureau of Mines for 1938 show Amer-

ican production of 1,613,155 lb. of vanadium; imports, all from Peru, 1,384,320 lb.

With the country's entire needs covered at home and from a friendly South American nation, no acute shortage is expected.

Easily Available Metals

The balance of the metals listed early in this article fall under the

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classification "neither strategic nor critical". Copper, lead, magnesium, molybdenum and zinc exist within this country's borders in such quantities that there is no fear of shortages. The country may confidently expect sufficient supplies for its needs, and although there may be price increases, they should be of reasonable proportions. In the case of copper there is an impending ceiling on prices, in the form of a proposed reduction in the

tax on copper imports from Chile involved in the proposed reciprocal trade agreement.

Zirconium

Zirconium, which has attracted increasing attention for use in alloy steels, is a foreign produced material but not yet commercially important enough to be viewed apprehensively. Most imports have been coming from Australia, India and Brazil. Norway

has been supplying ferrozirconium and zirconium ferrosilicon. There is no shortage of these materials at this time and no unusual price movement is expected.

Bismuth

American consumption of bismuth is estimated at only about 500 tons per year. It is extremely useful, however, for low melting point and non-shrinking alloys and its use is growing steadily for boiler plugs, safety devices, solders, dental models, tempering baths, small tools, etc. Imports amounted to 92,298 lb. in 1938, while exports were in the neighborhood of 225,000 lb. (about 900,000 lb. in 1937). America is the principal refiner from American and Mexican ores, although the Cerro de Pasco Copper Corp. in Peru is one of the principal factors in the world market.

Cobalt

More cobalt is now consumed in the United States than ever before, but none produced. The bulk of imports comes from Belgium, 617,088 lb., with Finland supplying 240,575 lb. and Canada, 80,779 lb. in 1938. The demand continues to expand for use in the manufacture of cobalt steels and in bright nickel-cobalt plating. Since the bulk of imports comes from the war area in ships subject to high risk, there will likely develop some shortage, and perhaps sharp advances in price.

Beryllium

Beryllium is one of the country's rare and high-priced industrial materials. Found quite commonly in nature, it is extremely difficult to extract from its mineral, beryl, which contains only about 4 per cent beryllium. Its use is expanding, however, as an alloying constituent in small percentages, mainly with copper, under the stimulus of reduced prices brought about by increased production. There is some interest also in beryllium-aluminum and in alloys with nickel.

Sources of beryl are South Dakota, Colorado, British India and Argentina. Imports in 1938 were reported as 146 tons compared with an estimated consumption in the neighborhood of 400 tons of beryl.

Not a strategic metal, but nevertheless one with a promising future, it may be stimulated to increased production by war demands, in which case the price trend, contrary to other metals, is likely to be downward.

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Detroit, Michigan

CRANES *Northern* **HOISTS**

World's Steel Soars

(CONTINUED FROM PAGE 104)

All the military acquisitions plus construction at home has raised Germany's iron and steel capacities to approximately 23,000,000 tons of pig iron and 29,000,000 tons of ingots. The insoluble problem is availability of raw materials, however, immediately quasi-war conditions shifted into actual war. From this total capacity Germany has to take care of the home needs of Germany, Austria, Czechoslovakia and Poland, as well as meet the enhanced requirements of the war industries. Furthermore, iron and steel products would be the most desirable export commodity acceptable to the Balkans and Russia, and it is hard to conceive of much being available for such a purpose even though in the previous year about 1,000,000 tons was exported, about 61 per cent going to Europe, 14 per cent to Africa and 16 per cent to South America.

Canadian Imports Drop

Another nation on a war footing, this time near at home, is Canada, where current production is establishing new records. This country is a piddling producer of steel when compared with the United States, but developments in Canada have had some effect on the Colossus to the South. Canadian imports of iron and steel in 1939 from the United States and the United Kingdom dropped considerably, what with internal production climbing closer to internal consumption. Canadian mills are now supplying two-thirds of the country's needs, a particularly significant feature being tin plate production, which has driven down imports from a value of \$13,877,000 in 1937-38 to \$7,769,000 in 1938-39. Canadian imports of wire and pipe from the United States are being substantially reduced, and producers here have no sensible reason for looking on the Dominion as a substantial outlet over the nearby years. Nor have mills here a great deal in prospect from South America.

Mills in South America

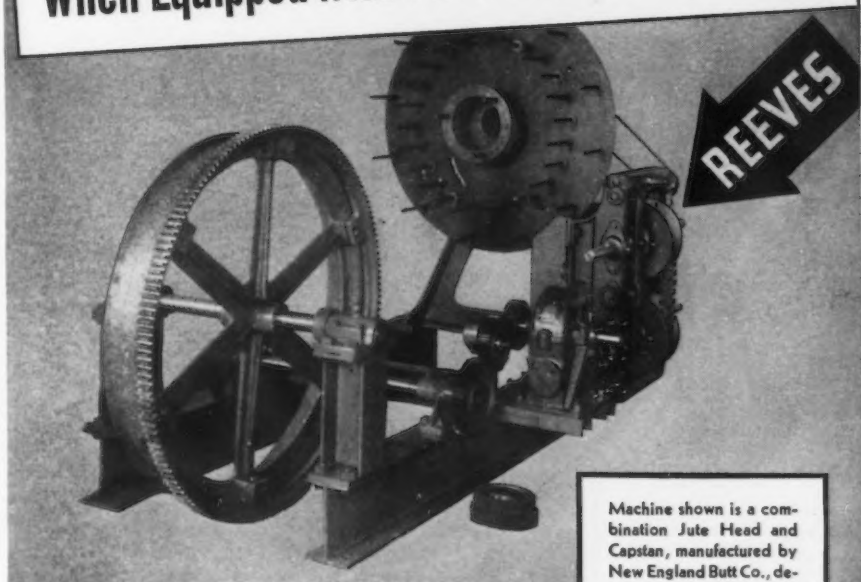
Each year as the world steel survey is prepared it becomes increasingly obvious that the nationalistic spirit of

self-sufficiency is still in full flood rather than on the wane. In Brazil there is some new construction going up at Monlevade which will cut imports further, and total sales to that country of all steel products, from phonograph needles to girders, is now on the order of 220,000 tons yearly. In Argentina, three rolling mills are now in operation, all of course of a modest nature. The steel mill owned by the Ministry of War, placed in operation in 1937, is reported to be plan-

ning an addition of a plate mill. A second company is reported to be building new rolling mills for round and square bars on the outskirts of Buenos Aires. These plants are all small and operate on a heavy scrap charge, but they cut down imports into the country which at no time are large.

In fact, several steel companies in the United States have expressed the opinion that there are at least eight or ten steel consuming companies in the United States which are more

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Machine shown is a combination Jute Head and Capstan, manufactured by New England Butt Co., designed to cover a wire cable with heavy coating of jute. REEVES Transmission regulates speed for various sizes of cable and thickness of jute.

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 REEVES SPEED CONTROL

profitable customers individually than all of South America.

Mexico

It has been announced by the Government that plans are in existence for the construction of a large smelting works in the Guanajuato state with an estimated daily output of 3000 to 5000 tons of iron.

Denmark

The Danish steel works, Varde Staalvaerk, is being enlarged in order

to take up production of an increased range of products. A high frequency furnace is being installed for the further production of special steels, including stainless steel. This will be the first plant to manufacture stainless steel in Denmark, all supplies having previously been imported from Germany, Sweden and the United Kingdom.

China

Despite a comparatively minuscule output, probably of all the changes oc-

curing in the world during the past year in iron and steel production the shifting of Chinese facilities into the interior to escape the Japanese invasion are the most dramatic. From Hanyang, where formerly was located the famous Hanyan Iron Works, two 100-ton and two 250-ton blast furnaces and two 30-ton open hearths have been removed into the interior. Although actual production from these furnaces has not yet begun, preparations are being pushed forward under the direction of the Ministries of War Economies to help the plant resume operation with the least possible delay. Meanwhile, a chain of smaller units, including a plant with a manufacturing capacity of 8000 tons of crucible steel and 10,000 tons of soft steel every year are being constructed in western China to supply the Government arsenals and factories.

In Szechuen, whose coal reserves rank next in abundance only to Shansi and Shensi provinces and whose iron ore resources are the richest among the southeastern provinces, the nation has found a new center for heavy industries. Aside from Chungking, where there are at least five works engaged in iron and steel production or fabricating work and about two dozen small engineering shops, many others have been found far and wide in the hinterland province.

Experiments are being carried out in Chungking in the production of the higher grade steel alloys such as ferrotungsten, ferrosilicon and ferromanganese.

Because of the abundance of coal and iron ore mines in the province, Szechuen has a number of works in addition to those located in and near Chungking. Besides these plants, the native furnaces are contributing no unimportant supply to the nation's war needs. There are approximately 100 native furnaces scattered throughout the province with a total output of 25,000 tons of pig iron. In one district along the Szechuen-Kweichow highway 33 native furnaces are working day and night to supply the works in Chungking and elsewhere with pig iron. Officials are now studying the possibilities of doubling the production of raw iron from the native furnaces by giving them technical and financial help.



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cut of any
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market."*

MILLERS FALLS COMPANY
GREENFIELD, MASSACHUSETTS



Mars and Machine Tools

(CONTINUED FROM PAGE 110)

by one prime factor—that aircraft is potentially so important as a weapon of defense that no country can afford to be without adequate air forces. Much of the equipment bought by the French last fall was the duplicate of that sold to French aircraft engine plants about two years ago. Considerable time was spent then in working up tooling programs in line with modern American methods. Hence there was no need in wasting time in revising tooling set-ups now, once war was on. This practice compares favorably with best American practice, perhaps is ahead of it as far as carbide tooling is concerned, but does not include fully automatic set-ups. The British have also been buying machine tools for the production of aircraft engines through American agents in England. More recently, a representative of one British aircraft engine company established headquarters in the United States for the purpose of facilitating these purchases.

Japanese Market

A few years back Japanese buying of U. S. metal working machinery amounted to two or three million dollars' worth of business annually. In 1937 shipments of such machinery to Japan jumped to \$12,152,000, or about three and a half times the previous year's volume. The following year was to see this figure almost doubled to the record figure of \$23,815,000 as the North China campaign got under way in real earnest. Part of this boost came from the drive to industrialize the conquered areas, particularly Manchukuo, which had been subdued in an earlier campaign (1931-32), although obviously much of the equipment was needed for the furthering of the war in China.

Estimates for 1939, based on shipments for the first nine months, point to a total volume of imports from the United States of about \$26,000,000 or better, breaking all previous records. (In 1918, best war year, the Japanese imported less than \$4,000,000 worth of metal working machinery from this country.) In 1940, a decline is likely to be registered, despite the fact that Japan must turn, and has turned, to the United States for the large, heavy machinery it had been importing from Germany up until the outbreak of war. Furthermore, spurred on by the increased tempo of buying

by France and Great Britain, local Japanese export-import houses stepped up their purchases in the last few months of 1939 so as to get their commitments on machine tool builders' schedules for 1940 production. It is doubtful, however, if machine tool firms here were enabled to allocate

as much of their production capacity to Japan in 1940 as they obviously did in 1939, particularly since not all Japanese buyers were quick to realize the change in export market conditions produced here by the war and to place their orders before deliveries became too extended.

The German source is practically cut off, and English imports will probably be restricted by Britain's own requirements for home needs. Besides, the British were rapidly eliminating

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themselves from the Japanese market by quoting deliveries up to 33 months on certain classes of machine tools. Another indication of market trends is that the Japanese in October pegged the yen to the American dollar instead of to the English pound, although the instability of the pound was perhaps the chief reason for doing so. Obviously Japan wishes to conserve its currency, but nevertheless permits for machine tool imports were quickly granted to meet the world competitive

situation last fall. On the other hand, like the Russians, the Japanese have been obliged to meet the same terms the French have offered on recent purchases.

Japanese buying houses in New York express the opinion that practically no further business can be placed here for delivery before the end of 1940 and that such a situation will tend to dry up new buying because of the reluctance to make commitments more than a year ahead. It is appar-

ent that the announcement by the Department of State of its intention to abrogate the trade treaty between the United States and Japan had little effect in speeding up buying since none of the orders placed were for delivery much earlier than March. The spurt in buying was rather the result of a change in the competitive condition of the world machinery markets. If the trade treaty is not replaced by a new one by Jan. 26, the absence of one will merely mean that the situation is subject to change without prior notice; for example, at the discretion of the United States Government an embargo might be clamped on exports to Japan at any time after that date.

The Russian Picture

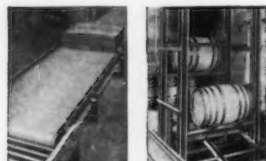
Soviet Russia began to buy machine tools and other metal working equipment here in volume in 1930 and 1931. Total purchases ran to about \$22,500,000 in the latter year. Shipments to Russia fell off sharply in 1932 and 1933 as Germany continued to increase its share. Russian imports of American machine tools did not begin to assume importance again until 1935 and 1936, but fell off sharply in 1937 when German machines were once more in demand. With the Rome-Berlin Axis emphasizing its Anti-Comintern Pact in 1938, however, the U. S. S. R. again turned to the United States and placed the biggest volume of metal working machinery business ever to come from one country. At \$34,690,000, this figure exceeded the war time purchases of any of the Allied belligerents in 1914-18 by a substantial margin, and were almost three times the purchases of Czarist-Russia in 1917. And this, despite the fact that the United Kingdom once more became an important supplier of machine tools to the U. S. S. R. as a result of the granting of credits for these purchases. These credits have since been cut off, after steadily rising British trade in the first half of 1939. The United States supplied about three-quarters of the machine tools imported into Russia in 1938, representing over one-third the total exports from here.

Based upon shipments for the first nine months, total exports of metal working machinery to the U. S. S. R. in 1939 will be about half the previous year's volume. This year, 1940, will see a much reduced volume of sales. It will see purchases of fill-in items rather than complete lines. Disturbances in the shipping situation to Russia began with the opening of hostilities in early September, and are obviously a factor. Furthermore, a decided

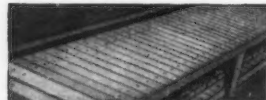
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PUT FLOW INTO PRODUCTION

coolness toward Russian business had developed in this country since the signing of the Nazi-Soviet alliance last August, and this coolness turned into a reluctance to do business at all when the Russians ruthlessly invaded Finland in December. Besides, the American manufacturers no longer needed the Russian business, swamped as they are with tremendous orders from France, on top of large British and Japanese business placed last fall.

For Russia, Germany again is to be the chief source of supply as it was in 1933, when it supplied 87 per cent of the combined imports from England, the United States and Germany. According to a report of the Federation of German Machinery Industries, the Soviet Union in October placed orders in Germany for more than \$50,000,000 of machine tools, to be delivered over a two-year period.

This does not mean to say that all American machine tool builders have suddenly ceased to do business with the U. S. S. R. But much fewer care to, and there have been some orders cancelled. Some still recall that it was the Russians that tided over the machine tool industry in 1931 when the domestic market was flat. The Russians offered not much help in 1932 and 1933, however, when things were at their blackest.

Much of the machinery shipped to Russia from the United States has undoubtedly been for the further industrial expansion of the country, in line with the successive five-year plans. But in a rearming Europe, it is equally true that a large percentage of late shipments have been to build up the Soviet war machine. The largest machine tools ever built in this country have gone to Russia in the past year or two for the production of large caliber guns. Some of the largest presses built here have gone to Russia for aircraft production, employing the latest American techniques. Much machinery has gone for automotive production, too, but this is a type of industry most readily converted to war purposes.

The fact that the machine tool export market is now a sellers' market as far as American suppliers are concerned has had another effect upon Russian business. During the last two years, the U. S. S. R. had been pressing for more liberal terms, and also had been increasing the amount of inspection demanded during the processing of their orders, to the point where Russian inspectors had become a veri-

table nuisance. All this has changed in recent months. The Russians, and the Japanese for that matter, are obliged to meet the same liberal terms granted by the French, and the rigid inspection procedure is being eliminated from new contracts.

Competitive Considerations

In the scramble for American machine tools, the Japanese had one advantage over the French—that of long established business connections in

New York. The principal Japanese export-import houses like Mitsui and Mitsubishi have been for years the selling agents in Japan of the leading American machine tool builders. Language barriers are broken down by employing, as contact men, American citizens who speak the language of the trade. These people consider themselves a part of the selling organization of the American builder; as indeed they are, and therefore look for preferential treatment or at least no worse

MEETING NEW NEEDS



● Each new year brings new problems for strip steel manufacturers. The use of strip steel for new designs and products sometimes requires almost revolutionary combinations of analyses, physical properties, tolerances, finishes, etc. Engineering skill alone is not always enough to apply steel to the intended job. The steel must first be made to fill the particular demand expected of it, and this means men with new ideas and mills equipped to carry out their plans. To the cold rolled strip steel buyer we can offer a completely modern plant, equipped to meet unusual requirements, and manned by men who do make worthwhile contributions to the industry.

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treatment as to priority of shipment than they were accorded before.

The British set-up is somewhat similar though not so concentrated. France by comparison was a neglected market, but what agency contracts as did exist posed a major problem in policy for the French Purchasing Commission. The agents did no work in connection with the new business, yet obviously they had laid some of the groundwork for their American principals in years gone by. They will probably be called

upon to do some follow-up and service work in connection with the machinery after it is shipped. At last report, the matter was still under discussion, but a compromise is being effected. The French Government is not unmindful of its responsibility in requesting modification of existing contracts, and will probably work out a degree of compensation commensurate with past efforts of these agents.

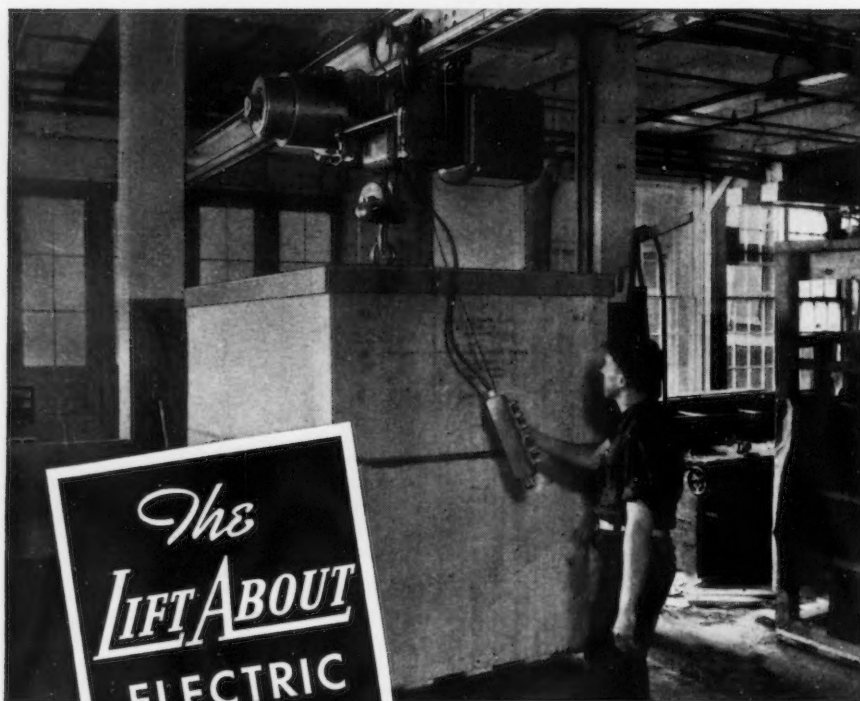
Mention has been made only of the principal buyers. Altogether, follow-

ing the outbreak of war, there were buyers operating in New York on behalf of seven or eight countries—each competing with the other for early deliveries and dangling plums of cash with order.

Summary of Export Market

It is the opinion of export buying houses that few machine tools are now available for shipment this year to any foreign customer. The French business has been scheduled right through 1940. The Japanese were quick to follow suit in bulking their orders to obtain favorable positions on American manufacturers' schedules. The English, slower to act, are nevertheless well protected. Russian buying, which is definitely on the decline, will not be missed. This does not mean to say of course that the domestic buyer is left out in the cold. Rather what is meant is that many machine tool builders have engaged themselves with as much export business as they care to ship in 1940, but have left plenty of openings in their production schedules the last half of the year to take care of regular domestic customers, including the requirements of our own Government.

Total exports of metal working machinery from the United States have been increasing steadily since 1932, although there have been fluctuations in the total output of the industry. For example, for the machine tool industry, 1938 was a relatively poorer year than 1937. The yearly average index of orders dropped from 186.9 to 102.8, yet exports of strictly machine tools jumped from \$38,538,000 in 1937 to \$64,628,000 in 1938. For all classes of metal-working machinery, the corresponding figures were \$64,304,000 and \$101,656,000. Total exports in 1939 are estimated at \$113,000,000, of which machine tools will account for about \$80,000,000 or more, based upon actual shipments during the first nine months. It seems safe to say that exports will be higher in 1940, despite the falling off in exports to Russia. Should domestic buying fail to come up to expectations, then total exports will become greater because of the larger productive capacity that will be released for export trade. Export volume in 1937 amounted to about 35 per cent of the total sales of the machine tool industry, and rose to an estimated 68 per cent in 1938, but dropped relatively to 45 per cent in 1939, because of the much better domestic volume.



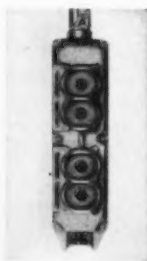
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356 SCHUYLER AVENUE . . . MONTGOMERY FALLS, N. Y.

In a world where brute force rules, the United States is looking to its armament too, and spent millions last year for machine tools in rehabilitating its arsenals and Navy yards. Few people in Government service seem to realize, however, what our own program is up against in the way of foreign competition for deliveries of machine tools. Considering general world conditions, our own preparedness program is not going ahead as fast as many think it should.

What of the U. S.?

It is regrettable that our Government is badly handicapped in meeting the terms of the principal foreign buyers, and is slowed up by stiff, formal procedure in calling for bids, not to forget the unwelcome penalty clauses if delivery schedules are not met. But that is the law. Small wonder then that some manufacturers, their order books bulging and foreign buyers clamoring for more and earlier deliveries, are disinterested in bidding on Government business at this time, much to the detriment of local dealers incidentally. It is a question of how long a Government charged with the responsibility of the future of the nation can tolerate a situation of this kind. It is a fair assumption that the next step will be to deformalize negotiations and possibly set up a central machine tool purchasing bureau such as was done in 1917-18. The average delivery on a machine tool now is four to six months for domestic shipment, thus pointing to the danger of waiting for an emergency to arise before establishing an accelerated buying pace.

Other Domestic Angles

To some extent, the French buying program has been tied with our own domestic needs, particularly those of the aircraft industry. Following the placement of large Allied contracts, expansion programs were initiated by all the leading aircraft manufacturers. The engine builders particularly placed huge orders for machine tools, and there is some hint that the French financed these purchases or at least provided for the writing off of the cost of new machinery during the life of the contracts, reputedly three years. For a few months last fall, this source of orders plus War Department and Navy buying accounted for about 85 per cent of the domestic volume.

Fortuitously or not, many machine tool builders had inaugurated expan-

sion programs last year, either by increasing their floor space or modernizing their facilities or both. In fact, during the last half of 1939, the machine tool industry was one of its own good customers, next to the sources of business mentioned above. By the time this equipment is installed, some companies will have increased their potential output by as much as 25 per cent. There has been some farming out of foundry and parts work, and at least one firm has been organized, un-

der license from the original machinery builder, to supply the foreign trade with strictly war needs. As yet, however, there has been no mushroom growth of machinery firms making copies of standard machines without license, such as occurred in 1917-18. The net result is that the machine tool industry will be in a good position to serve Uncle Sam and its other domestic customers this year, despite the biggest backlog of foreign orders in its history.

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Welding Serves Industrial Upswing

(CONTINUED FROM PAGE 118)

Application of atomic hydrogen welding is increasing. Equipment combining in one compact unit all the electrical devices used with the process is available, and for automatic welding, equipment with either single or

multiple arc heads can be supplied. Equipment supplying as many as 10 arcs has been furnished.

Resistance Welding Registers Notable Advances

IN the resistance welding field, developments of the past five years are said to have exceeded those of the preceding 46 years of this 51-year-old production process.

This is attributed to the development of electronic controls and of the

alloy coppers for electrode purposes. Electronic controls have made possible decided improvements in the design of the machines themselves, resulting in the opening up of new fields of application and making available greatly improved equipment for the older resistance welding jobs. Heavy machines, made practical through interrupted heat control and variable pressure control, synchronized with machine operation, have enabled the welding of increased sections formerly in other fields of fabrication, states one manufacturer.

On the sales side, shipment of resistance welding machines in 1939 were 35 to 45 per cent greater than in 1938, according to data compiled by the Resistance Welder Manufacturers Association. Shipments during October were approximately 50 per cent ahead of the same month in 1938. Furthermore, unfilled orders on hand as of Oct. 31 were higher than at any time during the previous 12 months.

Many Types and Sizes

All types of resistance welders—spot, projection, seam, flash and butt—are built in a range of standard sizes and capacities, and these may be equipped with various types of control, both pressure and timing, and with work-holding fixtures, automatic feeds, work-locating and alining devices, ejectors, precision indexing and other devices to suit requirements.

Spot welders are available in sizes ranging from small, low-powered bench and floor type machines, and portable gun welders, up to large heavy-duty presses that develop pressures upward of 60,000 lb. per sq. in. These presses, themselves built in a range of sizes, are one of the most highly developed of resistance welders, and offer very high production possibilities through multiple spot or projection welding and also through automatic feeds, indexing devices, work-holding fixtures and other devices.

Automatic spot welders equipped with as many as 100 or more electrode points and stations for the welding of complete assemblies rigidly clamped in special fixtures are built by several manufacturers.

Flash and butt welders range from small bench machines for fine wire up to large hydraulic strip welders with flash trimmers used in steel mills. Machines for stock of any shape, and arranged for hand, air, hydraulic or motor operation and for welding a variety of metals, including copper,

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**INITIAL-PINCH TYPE PLATE
BENDING ROLL** Capacity 12" X 3/4"

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CAMBRIDGE CITY INDIANA

A complete line of heavy machinery for punching, shearing and bending sheet metal and heavy plates.

bronze, aluminum, stainless steel and other alloys are available.

Multiple Wheel Seam Welders

In seam welding a recent development is the multiple wheel welder using the series system of welding, described by R. T. Gillette, General Electric Co., at the recent annual meeting of the American Welding Society. With two wheels above the work and a fixture or conductor bar underneath it, two welds are made at one time. This type of welder is adaptable to many types of work, particularly jobs of large size, such as cabinets, refrigerator parts and structures as large as rail cars. As they are equipped with electronic interrupters, seam welders of this type may also be used to make long rows of spot welds.

One machine cited by Mr. Gillette makes spot welds between two pieces of an 0.025 in. stainless steel refrigerator evaporator at the rate of 2400 welds per min. Another machine is employed on a plate refrigerator condenser made from two pieces of 0.037 in. low-carbon steel and having 20 parallel seams, a total of about 900 in. of weld. This seam welder has 10 welding wheels and five transformers. It is fully automatic with hydraulic drive and indexing, and is controlled by five fully synchronous interrupters.

Interrupted Method of Spot Welding

The interrupted method of spot welding, developed to obviate trouble in electrode maintenance when welding heavy material, is being increasingly employed. As described by Mr. Gillette, it consists of bringing the electrodes in contact in the usual manner, then applying current in a series of impulses rather than continuously. A typical welding procedure might consist of 10 cycles on and 5 cycles off, repeated 10 times for a certain thickness of material. This interruption of current allows a welding current to be built up in the weld without excessive heat in electrodes or surface of the work. Adequate water cooling of electrodes is necessary. Electrode life is greatly increased, a ratio of 100 to 1 being said to seem conservative.

The interrupted method of spot welding is also said to give better heat distribution on heavy material, allows time for good forging action on the weld, and if burning or spitting starts the current interruption stops it. An annealing cycle, an advantage on some alloy steels, can also be arranged.


Application of interrupted heat control is cited by one manufacturer as

recently making possible and practical the projection welding of torque tubes to a rear axle carrier assembly.

Hydraulic Strip Welder

A number of interesting resistance welder designs combining high production with accurate welding were supplied during the past year. One was an automatic press welder for making eight projection welds on a small part. It is equipped with a 12-station automatic dial feed, Geneva table indexing and a number of other refinements

comparable to machine tool design. Another company developed a motor-operated combination spot and projection welder, which though essentially heavy-duty equipment, can be arranged also to weld comparatively light work. It is powered with a 1500 kva. transformer and is capable of delivering pressures up to 10 tons. An air cushioned device is a feature. A new full automatic, hydraulic 38-in. strip welder with hydraulic flash trimmer features centralized control, convenience of operating adjustments by levers and



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4000 TONS OF
COAL IN 8 HOURS
by **DRAVO**

■ Dravo built this straight line coal unloading plant for the Pittsburgh & Lake Erie Railroad Company. A 7-ton bucket with fast travel handles 4000 tons in 8 hours from barge to cars. It has a free digging capacity of 7000 tons per hour. Two barges abreast can be unloaded at the same time, and, although the plant is stationary, the operator can move the barges along as unloading progresses. He does this by means of a shifting device controlled from his cab. And finally, it more than satisfies its owners.

Whether the problem is one of modernizing old equipment, replacing obsolete handling machines or designing special facilities to meet new problems, consultation with Dravo Corporation may prove to be of great value to you. Added to its ability to fabricate and erect structures as shown above, Dravo Corporation has had years of experience building docks, retaining walls, plant foundations—everything that enters into the problem of terminal facilities. Bulletin 403 describes docks, mill foundations and terminal equipment. Bulletin 202 describes revolving cranes. Either will be sent upon request. Inquiries relative to specific problems may be addressed to

DRAVO CORPORATION

ENGINEERING WORKS DIVISION

SHIPYARDS, PITTSBURGH, PA.—WILMINGTON, DEL.
GENERAL OFFICES AND SHOPS: NEVILLE ISLAND—PITTSBURGH, PA.

calibrated dials, and clamping fixtures that may be elevated clear of the dies without disturbing air, electrical or hydraulic connections, a feature which facilitates inspection, maintenance and removal of the welding dies.

Welds Dissimilar Metals

In percussion welding, a process claimed to permit in general the welding of any two pieces of metal without regard to their similarity as to thermal conductivity or material has been developed. Thus a rod of copper may be welded to one of stainless steel;

SAE 1045 steel to stellite; zinc to aluminum; cast iron to copper; etc. Furthermore, heat-treated parts are said to be welded without affecting the heat treatment.

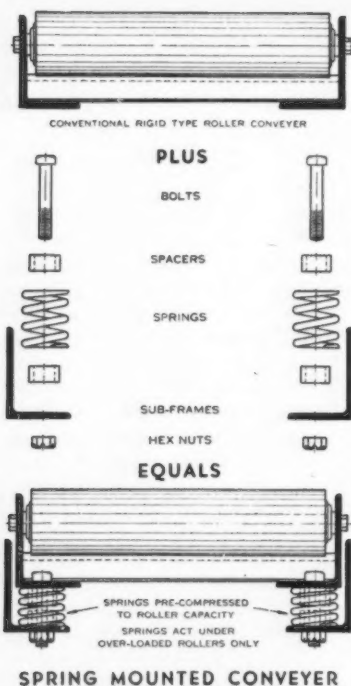
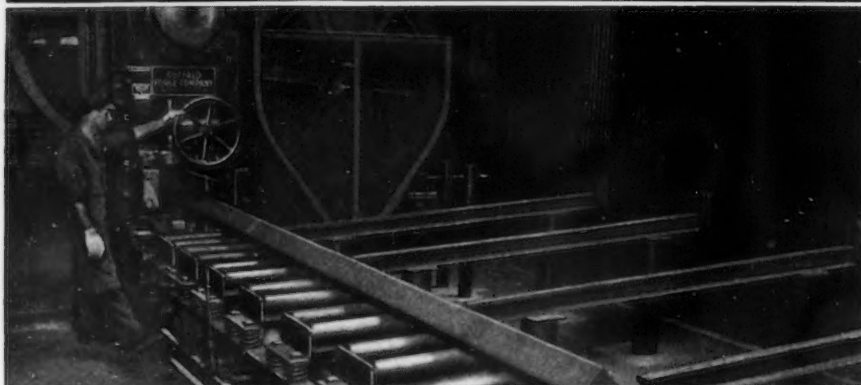
In this process an extremely short electric discharge, usually in the form of an arc, takes place between the two areas to be welded, and immediately following the discharge the two areas are brought into mechanical contact, simulating a hammer blow. As now developed the process is limited to areas up to $\frac{1}{4}$ sq. in., and these areas must be concentrated. The two pieces

comprising the weld must be separate, that is, the process cannot be used to form a ring or band from a single piece of metal.

Accessory devices brought out during the past year included a weld recorder that gives an audible signal when the electrical input to the welder (I^2t) varies sufficiently to cause a defective weld.

Thermit welding continues an important maintenance method in steel mills. The most recent application, however, is in the welding of runway rails of large cranes into continuous lengths in order to avoid the wear and batter of rail ends which occurs on rails jointed by means of splice bars and bolts.

MATHEWS SPRING MOUNTED CONVEYERS



CUT MAINTENANCE COSTS

THE principle is simple; the roller axles are rigidly locked in the frame as in the conventional "rigid type" construction, but the conveyor frame which retains the rollers is carried on pre-compressed coil springs. The springs are held in compression equal to the rated safe load of each roller. Under impact conditions or excessive loads the springs absorb the overload.

This construction represents the greatest improvement in roller conveyor in many years. Its application will reduce maintenance costs by prolonging the life of the equipment. When conditions are severe, "spring mounted" is the practical conveyor construction for the job.

Capacities from 150 lbs. to 8000 lbs. per roller available.

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CONTINUOUS FLOW PRINCIPLE OF HANDLING MATERIALS

Aluminum Alloy Parts Joined by Brazing

BRAZING methods for joining parts made from the aluminum alloys have been developed and used successfully on several commercial applications, according to G. O. Hoglund, welding engineer, Aluminum Co. of America. In general, these brazing methods involve the use of filler material with a lower melting point than the parent material, together with fluxes which melt at the brazing temperature and permit the filler material to wet the surface of the joint.

The brazing may be by the furnace, dip or torch methods. In furnace brazing the parts are assembled, fluxed and brought to a temperature above the melting point of the filler material but below that of the parent metal. In this method the number of parts or the number of joints on any one part is limited only by the furnace size. Dip brazing is accomplished by assembling the parts in jigs to maintain proper mating of faying surfaces and applying brazing heat by dipping the assembly in molten flux, held at a temperature that will wet the surface of the parent parts and permit the filler material to flow into the joint.

Although the details of the brazing process have not yet been worked out for all the aluminum alloys, a representative group of alloys, ranging in mechanical properties from those of commercially pure aluminum to those of the heat-treated alloys commonly used for welded parts, can be brazed. The strength of brazed joints in these alloys is said to be about the same as that of torch-welded joints.

THE IRON AGE

ANNUAL STATISTICAL SUPPLEMENT

JANUARY 4, 1940

Steel Ingot Production in the United States

(THE IRON AGE figures prior to June, 1917; American Iron and Steel Institute figures since then, with additions for electric and crucible steel)
(Thousands of Gross Tons)

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1902	1,223	1,060	1,192	1,256	1,321	1,185	1,189	1,211	1,209	1,268	1,174	1,268	14,556
1903	1,217	1,131	1,265	1,322	1,363	1,376	1,230	1,250	1,277	1,178	822	674	14,105
1904	759	1,020	1,239	1,325	1,263	1,100	885	1,001	1,153	1,196	1,262	1,327	13,530
1905	1,516	1,389	1,710	1,624	1,735	1,576	1,425	1,629	1,670	1,746	1,770	1,673	19,463
1906	1,928	1,746	2,018	1,848	1,956	1,833	1,739	1,794	1,757	2,047	2,029	1,929	22,624
1907	2,005	1,830	1,949	2,007	2,087	1,944	1,975	2,046	1,899	2,124	1,654	1,039	22,559
1908	934	954	1,057	1,023	1,004	972	1,049	1,171	1,263	1,401	1,350	1,499	13,677
1909	1,623	1,575	1,722	1,622	1,700	1,601	1,899	2,030	2,225	2,347	2,376	2,379	23,299
1910	2,404	2,257	2,506	2,365	2,203	2,157	1,904	2,016	1,956	1,929	1,818	1,639	25,154
1911	1,716	1,788	2,199	2,001	1,918	1,801	1,682	1,951	1,992	2,050	2,015	1,916	23,029
1912	2,169	2,191	2,441	2,491	2,648	2,461	2,445	2,648	2,484	2,833	2,759	2,715	30,285
1913	2,814	2,562	2,679	2,757	2,841	2,532	2,482	2,466	2,510	2,563	2,151	1,923	30,280
1914	1,907	1,881	2,287	2,285	2,039	1,930	1,907	1,944	1,895	1,799	1,470	1,476	22,820
1915	1,663	1,777	2,226	2,271	2,351	2,555	2,662	2,887	3,061	3,246	3,259	3,326	31,234
1916	3,333	3,321	3,627	3,356	3,652	3,473	3,245	3,481	3,463	3,672	3,581	3,198	41,402
1917	3,743	3,093	3,864	3,792	4,061	3,617	3,447	3,663	3,486	3,932	3,714	3,207	43,619
1918	2,641	2,725	3,728	3,791	3,939	3,696	3,732	3,696	3,832	4,017	3,668	3,586	43,051
1919	3,651	3,178	3,128	2,631	2,266	2,607	2,947	3,226	2,718	2,046	2,513	2,784	33,693
1920	3,624	3,402	3,917	3,132	3,423	3,539	3,328	3,562	3,561	3,581	3,133	2,779	40,881
1921	2,517	1,999	1,795	1,387	1,446	1,146	918	1,300	1,342	1,847	1,897	1,630	19,224
1922	1,893	2,071	2,814	2,902	3,219	3,128	2,953	2,629	2,818	3,410	3,430	3,301	34,568
1923	3,841	3,472	4,067	3,964	4,216	3,767	3,531	3,696	3,357	3,577	3,134	2,863	43,486
1924	3,650	3,826	4,207	3,348	2,640	2,066	1,878	2,553	2,828	3,125	3,121	3,569	36,811
1925	4,193	3,752	4,194	3,584	3,455	3,205	3,084	3,421	3,490	3,889	3,903	3,971	44,141
1926	4,132	3,785	4,469	4,106	3,928	3,734	3,635	3,987	3,913	4,074	3,706	3,467	46,936
1927	3,823	3,845	4,575	4,163	4,083	3,526	3,232	3,529	3,298	3,345	3,155	3,203	43,777
1928	4,028	4,081	4,549	4,345	4,246	3,778	3,841	4,217	4,156	4,693	4,306	4,055	50,325
1929	4,545	4,372	5,118	4,999	5,339	4,951	4,898	4,988	4,573	4,579	3,556	2,932	54,850
1930	3,808	4,067	4,288	4,142	4,014	3,445	2,945	3,085	2,863	2,714	2,230	1,995	39,595
1931	2,534	2,570	3,083	2,794	2,574	2,149	1,907	1,733	1,560	1,605	1,607	1,313	25,429
1932	1,500	1,496	1,448	1,273	1,137	923	815	856	1,003	1,099	1,043	871	13,464
1933	1,030	1,087	910	1,361	2,005	2,599	3,210	2,905	2,313	2,112	1,540	1,822	22,894
1934	2,025	2,243	2,836	2,976	3,447	3,102	1,509	1,399	1,286	1,502	1,633	1,991	25,949
1935	2,915	2,817	2,910	2,682	2,675	2,294	2,303	2,962	2,869	3,192	3,200	3,121	33,940
1936	3,086	3,002	3,384	3,991	4,097	4,035	3,975	4,247	4,214	4,601	4,389	4,491	47,512
1937	4,786	4,498	5,303	5,155	5,237	4,254	4,631	4,958	4,362	3,449	2,189	1,496	50,318
1938	1,764	1,726	2,038	1,951	1,831	1,660	2,008	2,580	2,692	3,158	3,618	3,185	28,211
1939	3,174	2,989	3,405	2,974	2,923	3,125	3,163	3,763	4,231	5,394	5,463	5,346*	45,950*

Monthly Production of Steel Ingots in the United States

(Per Cent of Capacity)

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average for Year
1914	56.55	61.78	67.82	69.97	60.47	59.10	56.68	57.65	58.16	53.35	45.02	43.87	57.50
1915	47.40	56.09	63.45	66.84	67.01	75.20	76.05	82.29	90.30	92.52	95.92	95.01	75.76
1916	85.90	91.59	93.48	89.33	94.12	92.44	83.83	89.72	92.37	94.64	95.32	82.62	90.42
1917	88.80	81.27	91.67	92.90	96.35	88.61	81.95	86.90	85.59	93.29	90.98	76.24	87.92
1918	59.16	67.60	83.51	87.69	88.24	85.50	83.79	82.80	88.85	89.99	84.85	80.51	81.94
1919	78.87	76.03	67.57	58.69	48.95	58.15	63.80	69.69	60.78	44.20	56.06	60.27	61.85
1920	76.88	77.21	83.09	68.61	72.61	77.52	70.75	75.56	78.18	75.97	68.63	59.08	73.48
1921	51.63	45.41	36.82	29.38	29.66	24.27	18.87	26.67	28.49	37.89	40.18	33.51	33.50
1922	38.14	46.21	56.70	60.38	64.86	65.09	59.63	52.97	58.77	68.71	71.37	66.66	59.17
1923	77.08	77.17	81.62	82.16	84.61	78.07	71.03	74.17	69.73	71.78	64.95	57.59	74.15
1924	72.48	81.30	83.54	68.65	52.42	42.36	37.37	50.69	66.07	62.05	63.99	71.02	61.94
1925	80.73	80.00	80.75	71.25	66.52	63.72	59.50	65.86	69.54	74.87	77.59	76.62	72.20
1926	87.09	88.35	94.18	89.36	82.79	81.27	76.78	84.03	85.37	85.88	80.65	73.23	84.05
1927	77.94	86.82	93.27	87.65	83.23	74.24	66.04	71.95	69.58	68.20	66.41	65.45	75.83
1928	80.33	87.09	90.73	89.49	84.69	77.82	76.78	84.11	86.42	93.60	88.69	81.07	85.05
1929	86.84	92.51	97.80	98.64	102.01	97.70	93.82	95.31	90.44	87.50	70.17	56.15	89.05
1930	71.42	84.47	80.42	80.21	75.29	66.73	55.36	57.86	55.57	50.90	43.18	37.50	63.09
1931	44.75	50.25	54.41	50.90	45.46	39.14	33.70	30.58	28.50	28.33	29.28	23.23	38.13
1932	25.97	27.72	25.07	19.68	16.49	14.14	14.81	14.81	17.96	19.01	18.64	15.09	19.75
1933	17.76	20.76	15.69	24.27	34.52	46.25	55.46	50.02	41.27	36.42	27.44	31.49	33.53
1934	34.33	42.10	48.10	52.11	58.43	54.30	25.66	23.74	22.57	25.47	28.59	33.84	37.38
1935	49.06	52.52	48.98	46.61	45.02	39.87	38.86	49.85	49.99	53.72	55.61	52.66	48.54
1936	52.39	54.53	57.40	69.99	69.58	70.75	67.61	72.11	74.05	78.15	76.94	76.42	68.36
1937	81.32	84.27	89.94	90.25	88.79	74.48	78.48	83.83	76.30	58.31	38.23	25.37	72.38
1938	29.17	31.63	33.72	33.34	30.30	28.36	33.29	42.68	46.09	52.25	61.81	52.79	39.65
1939	52.48	54.72	56.30	50.78	48.32	53.35	52.40	62.22	72.41	89.17	93.26	88.57*	64.54*

Average Weekly Production of Steel Ingots in the United States

(Thousands of Gross Tons)

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average for Year
1928	901	977	1,017	1,004	950	873	861	943	969	1,050	995	909	954
1929	1,016	1,082	1,144	1,154	1,193	1,143	1,097	1,115	1,058	1,024	821	657	1,042
1930	853	1,009	960	958	899	797	661	691	664	608	516	448	753
1931	567	637	689	645	576	496	427	388	361	359	371	294	483
1932	335	358	324	294	254	213	183	191	232	245	241	195	255
1933	230	268	203	314	446	598	717	646	533	471	355	407	453
1934	451	553	632	684	767	713	337	312	296	335	375	444	461
1935	648	694	647	616	595	526	513	658	660	709	734	695	641
1936	686	714	753	915	911	927	886	945	970	1,024	1,008	1,001	895
1937	1,065	1,104	1,178	1,182	1,163	975	1,031	1,101	1,002	766	502	333	949
1938	391	424	452	447	406	351	447	573	618	701	829	708	532
1939	717	747	768	693	660	728	716	850	989	1,218	1,273	1,209*	881*

Figures for 1939 are preliminary and do not include electric and crucible steel ingots. * THE IRON AGE estimate.

Pig Iron Production in the United States

(Thousands of Gross Tons)

(THE IRON AGE figures, including ferroalloys made in blast furnaces, but excluding charcoal iron)

	Jan.	Feb.	March	April	May	June	Half Year	July	Aug.	Sept.	Oct.	Nov.	Dec.	Second Half	Year
1901	1,162	1,134	1,279	1,257	1,339	1,318	7,489	1,360	1,336	1,300	1,382	1,362	1,266	8,006	15,495
1902	1,428	1,258	1,445	1,475	1,543	1,447	8,595	1,442	1,468	1,419	1,481	1,433	1,537	8,780	17,375
1903	1,473	1,391	1,490	1,608	1,714	1,673	9,449	1,546	1,571	1,554	1,426	1,039	847	7,983	17,432
1904	924	1,208	1,451	1,561	1,537	1,296	7,977	1,121	1,173	1,358	1,455	1,487	1,616	8,210	16,187
1905	1,782	1,597	1,936	1,922	1,964	1,793	10,994	1,742	1,844	1,899	2,053	2,014	2,046	11,598	22,592
1906	2,069	1,904	2,165	2,073	2,097	1,977	12,287	2,013	1,927	1,971	2,197	2,188	2,235	12,531	24,818
1907	2,206	2,045	2,226	2,219	2,295	2,235	13,226	2,256	2,250	2,184	2,237	1,828	1,234	12,089	25,315
1908	1,045	1,078	1,228	1,150	1,166	1,092	6,759	1,218	1,360	1,419	1,567	1,578	1,741	8,883	15,642
1909	1,798	1,707	1,836	1,739	1,883	1,931	10,894	2,103	2,249	2,385	2,600	2,547	2,636	14,520	25,414
1910	2,609	2,397	2,618	2,484	2,390	2,265	14,763	2,149	2,107	2,056	2,093	1,910	1,778	12,093	26,856
1911	1,759	1,795	2,171	2,065	1,893	1,788	11,477	1,793	1,927	1,977	2,102	2,000	2,043	11,842	23,313
1912	2,058	2,101	2,405	2,375	2,513	2,441	13,893	2,411	2,512	2,464	2,690	2,631	2,782	15,490	29,383
1913	2,795	2,586	2,764	2,753	2,822	2,629	16,349	2,561	2,546	2,506	2,546	2,233	1,984	14,376	30,725
1914	1,885	1,888	2,348	2,270	2,093	1,918	12,402	1,958	1,995	1,883	1,778	1,518	1,516	10,648	23,050
1915	1,601	1,685	2,064	2,117	2,263	2,381	12,101	2,563	2,780	2,853	3,126	3,037	3,203	17,562	29,663
1916	3,185	3,087	3,339	3,227	3,361	3,211	19,410	3,224	3,204	3,202	3,509	3,312	3,178	19,629	39,040
1917	3,151	2,645	3,252	3,335	3,417	3,270	19,070	3,342	3,248	3,134	3,303	3,206	2,883	19,116	38,186
1918	2,412	2,319	3,213	3,288	3,447	3,324	18,003	3,421	3,389	3,418	3,487	3,354	3,434	20,503	38,506
1919	3,303	2,940	3,090	2,478	2,108	2,115	16,034	2,429	2,743	2,488	1,864	2,392	2,633	14,549	30,583
1920	3,015	2,979	3,376	2,739	2,986	3,044	18,139	3,067	3,147	3,129	3,293	2,935	2,704	18,275	36,414
1921	2,416	1,937	1,596	1,193	1,221	1,065	9,428	865	954	986	1,247	1,415	1,649	7,116	16,544
1922	1,645	1,630	2,036	2,072	2,306	2,361	12,050	2,405	1,816	2,034	2,639	2,849	3,087	14,830	26,880
1923	3,229	2,994	3,524	3,550	3,868	3,676	20,841	3,678	3,450	3,126	3,149	2,894	2,921	19,218	40,059
1924	3,019	3,075	3,466	3,233	2,615	2,026	17,434	1,785	1,887	2,053	2,477	2,510	2,962	13,674	31,108
1925	3,370	3,214	3,564	3,259	2,931	2,674	19,012	2,664	2,705	2,726	3,023	3,023	3,250	17,391	36,403
1926	3,316	2,923	3,442	3,450	3,482	3,235	19,848	3,223	3,201	3,136	3,334	3,237	3,091	19,222	39,070
1927	3,104	2,941	3,483	3,422	3,391	3,090	19,431	2,951	2,947	2,775	2,784	2,648	2,696	16,801	36,232
1928	2,870	2,900	3,200	3,185	3,284	3,082	18,521	3,072	3,137	3,062	3,374	3,302	3,370	19,317	37,838
1929	3,442	3,206	3,714	3,663	3,898	3,717	21,621	3,785	3,756	3,498	3,588	3,181	2,837	20,665	42,286
1930	2,827	2,839	3,246	3,182	3,233	2,934	18,261	2,639	2,524	2,277	2,165	1,867	1,666	13,139	31,399
1931	1,714	1,707	2,032	2,020	1,994	1,639	11,105	1,463	1,281	1,169	1,173	1,103	980	7,170	18,275
1932	972	964	967	852	783	628	5,168	572	520	592	644	631	546	3,518	8,686
1933	569	554	542	624	887	1,265	4,441	1,792	1,833	1,522	1,356	1,085	1,182	8,902	13,213
1934	1,215	1,264	1,620	1,727	2,043	1,930	9,798	1,225	1,054	898	951	957	1,028	6,113	15,911
1935	1,477	1,609	1,770	1,663	1,727	1,553	9,799	1,520	1,761	1,777	1,978	2,066	2,106	11,209	21,008
1936	2,026	1,824	2,040	2,404	2,648	2,586	13,528	2,594	2,712	2,730	2,992	2,947	3,115	17,090	30,618
1937	3,212	2,999	3,459	3,392	3,537	3,108	19,707	3,499	3,606	3,410	2,892	2,007	1,490	16,904	36,611
1938	1,429	1,298	1,453	1,376	1,255	1,062	7,873	1,202	1,494	1,680	2,052	2,270	2,211	10,909	18,782
1939	2,175	2,060	2,395	2,056	1,718	2,118	12,522	2,356	2,660	2,879	3,628	3,720	*3,750	*18,993	*31,515

* Estimated.

Monthly Shipments of Steel Products by United States Steel Corp., Tons

(Reported by U. S. Steel Corp.)

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	*Total
1931	800,031	762,522	907,251	878,558	764,178	653,104	593,900	573,372	486,928	476,032	435,697	351,211	7,676,744
1932	426,271	413,001	388,579	395,091	338,202	324,746	272,448	291,688	316,019	310,007	275,594	227,576	3,974,062
1933	285,138	275,929	256,793	335,321	455,302	603,937	701,322	668,155	575,161	572,897	430,358	600,639	5,805,235
1934	331,777	385,500	588,209	643,009	745,063	985,337	369,938	378,023	370,306	343,962	366,119	418,630	5,925,873
1935	534,055	583,137	668,056	591,728	598,915	578,108	547,794	624,497	614,933	686,741	681,820	661,515	7,371,299
1936	721,414	676,315	783,552	979,907	984,097	886,065	950,851	923,703	961,803	1,007,417	882,643	1,067,365	10,784,273
1937	1,149,918	1,133,724	1,414,399	1,343,644	1,304,039	1,268,550	1,186,752	1,107,858	1,047,962	792,310	587,241	489,074	12,748,354
1938	518,322	474,723	572,199	501,972	465,081	478,057	441,570	558,634	577,666	663,287	679,653	694,204	6,655,749
1939	789,305	677,994	767,910	701,459	723,165	733,433	676,309	803,822	985,030	1,218,545	1,270,894	.....	.....

* Less yearly adjustment.

Fabricated Structural Steel Orders in the United States, Net Tons

(From United States Department of Commerce Through 1932; 1933 on From American Institute of Steel Construction, Inc.)

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1912	154,070	169,260	147,560	128,030	219,170	160,580	154,070	175,770	141,050	199,640	138,880	145,390	1,933,470
1913	130,500	162,000	110,250	90,000	119,250	96,750	130,500	96,750	65,250	78,750	60,750	60,750	1,201,500
1914	140,740	143,010	172,520	199,760	129,390	127,120	154,360	63,560	86,260	79,450	45,400	79,450	1,421,020
1915	57,750	69,300	147,840	143,220	140,910	184,800	198,660	196,350	154,770	180,180	242,550	279,510	1,995,840
1916	164,220	178,500	242,760	173,740	190,400	135,040	114,240	152,320	128,140	183,260	185,640	204,680	2,053,940
1917	147,620	142,750	164,560	147,620	135,520	113,740	101,640	91,960	70,180	147,620	186,340	275,880	1,725,460
1918	136,740	144,480	121,260	165,120	154,800	144,480	299,280	147,060	154,800	110,940	69,660	74,820	1,723,440
1919	31,920	34,580	47,880	66,600	130,340	172,900	196,840	207,480	207,480	207,480	183,540	226,100	1,713,040
1920	207,000	262,200	231,840	187,680	171,120	158,000	138,000	110,400	118,680	71,760	74,520	71,760	1,782,960
1921	50,940	39,620	82,070	87,730	79,240	104,710	96,220	93,390	135,840	152,820	155,550	113,200	1,191,430
1922	121,600	133,760	234,080	258,400	240,160	221,920	206,720	206,720	194,560	176,320	152,000	185,440	2,331,680
1923	227,760	243,360	290,160	243,360	177,840	165,360	162,240	184,080	165,360	159,120	171,600	249,600	2,439,840
1924	224,940	228,200	221,680	208,640	192,340	208,640	224,940	195,600	211,900	210,580	270,580	247,760	2,647,120
1925	187,380	194,320	225,550	256,780	229,020	284,540	274,130	267,190	270,660	298,420	239,430	253,310	2,980,720
1926	208,800	208,800	234,000	252,000	266,400	262,800	245,400	284,400	216,000	288,500	236,250	262,500	3,048,750
1927	195,000	240,000	232,500	262,500	232,500	225,000	341,250	270,000	262,500	257,950	232,500	246,400	3,287,900
1928	207,900	265,650	257,950	234,550	308,000	296,450	296,450	354,200	319,550	319,550	212,135	297,605	3,597,825
1929	256,025	250,635	334,565	313,775	321,475	324,170	329,175	340,725	297,990	319,550	181,200	152,800	2,707,600
1930	238,800	267,600	236,800	222,800	297,200	253,800	270,000	282,000	155,600	209,200	90,800	97,600	1,880,800
1931	158,000	158,800	178,800	284,800	152,400	172,400	159,600	124,000	194,400	109,200	90,800	143,800	1,555,000
1932	48,400	62,000	64,400	64,800	99,800	86,800	67,200	78,800	111,200	74,400	51,600	103,900	9

Bookings of Fabricated Steel Plate in the United States, Net Tons (From United States Department of Commerce)

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1925	30,013	24,167	26,777	27,656	32,889	38,496	34,382	40,660	31,001	34,766	32,847	35,792	389,446
1926	29,965	39,889	43,089	39,662	52,890	44,938	37,300	51,342	38,860	45,139	63,271	30,034	516,378
1927	36,043	59,843	55,675	47,611	38,063	28,936	35,609	48,780	38,863	47,296	27,524	35,877	500,120
1928	51,647	64,909	55,016	55,552	49,313	40,738	41,629	51,008	43,499	59,836	62,914	52,204	628,265
1929	40,570	70,314	69,344	54,246	58,293	57,975	58,456	51,590	51,842	45,661	52,642	27,742	638,675
1930	57,083	34,662	46,137	45,454	38,328	41,774	38,283	36,513	41,066	30,197	33,151	26,787	469,435
1931	27,518	24,438	31,056	29,916	26,210	22,806	27,261	24,282	33,473	20,839	18,268	16,442	302,509
1932	17,613	17,755	12,564	14,074	17,888	18,383	12,485	11,916	11,109	16,737	7,873	9,510	167,907
1933	11,128	16,588	8,903	9,502	16,243	37,020	20,058	16,320	16,166	17,964	14,466	13,692	198,050
1934	15,897	14,641	38,924	20,085	21,891	27,395	12,523	16,293	15,108	16,581	16,629	26,025	241,992
1935	18,778	15,064	16,832	13,244	17,630	17,914	18,890	23,628	31,105	30,530	19,116	35,584	258,315
1936	38,709	27,863	30,437	30,018	51,443	52,937	60,324	31,999	35,033	33,791	40,465	51,017	484,036
1937	41,419	32,375	71,250	42,455	28,913	34,833	27,480	31,763	31,484	31,942	27,507	27,463	428,884
1938	23,422	17,827	38,052	21,958	25,141	20,044	27,773	22,069	18,551	21,793	20,213	28,218	285,061
1939	20,511	22,903	29,784	35,844	34,036	33,959	31,364	21,828	39,751	37,766	.....	.....	.....

Steel Castings Orders in the United States, Net Tons (From United States Department of Commerce)

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1922	43,230	46,520	60,080	94,920	97,350	112,120	83,010	79,560	122,840	94,980	76,400	86,420	997,430
1923	126,481	112,399	172,101	118,196	117,834	109,756	73,600	76,208	71,506	64,677	63,870	61,016	1,167,644
1924	69,872	91,502	126,986	93,518	79,988	68,019	54,538	50,321	76,005	83,221	91,388	115,605	1,000,963
1925	104,179	81,930	83,812	87,556	78,417	66,437	72,294	71,160	62,198	80,510	86,957	105,893	981,343
1926	112,322	101,495	113,770	91,540	84,451	73,785	79,798	71,325	69,740	77,836	73,477	90,143	1,039,682
1927	108,063	94,938	90,353	81,403	73,043	91,199	74,569	63,938	52,742	52,160	63,075	77,436	922,921
1928	91,448	91,076	83,755	84,086	86,796	72,107	66,992	81,256	82,762	78,860	84,742	96,318	1,000,228
1929	124,313	115,639	130,836	144,366	113,092	94,873	103,046	101,514	86,241	35,879	97,635	89,985	1,337,419
1930	101,500	114,419	122,462	92,987	91,077	61,164	57,850	50,370	49,542	45,552	48,123	49,387	884,433
1931	46,810	40,320	48,184	46,039	39,052	26,136	32,869	27,458	23,073	22,854	20,001	20,799	393,595
1932	17,214	16,759	16,323	12,459	11,111	12,488	9,301	10,147	11,882	11,896	13,235	13,022	155,837
1933	14,450	13,179	13,178	15,942	22,612	34,965	31,878	31,502	25,220	26,135	25,558	25,612	280,231
1934	26,296	35,698	60,046	63,142	46,831	41,537	41,822	25,538	20,030	24,327	21,552	27,312	434,131
1935	32,349	31,725	30,723	28,233	29,083	30,257	34,570	45,426	29,995	34,553	32,714	40,529	400,157
1936	59,019	51,701	71,341	83,188	63,950	94,345	74,011	59,393	56,877	59,431	76,394	159,430	909,080
1937	115,150	98,383	158,284	99,868	68,688	71,817	57,799	54,753	57,414	36,837	31,442	27,024	877,459
1938	29,187	30,863	28,096	21,869	20,636	21,419	36,641	24,814	25,565	25,418	30,428	38,342	333,278
1939	42,024	30,360	41,367	34,100	41,660	37,774	34,804	39,698	96,657	119,687	.....	.....	.....

Malleable Castings Orders in the United States, Net Tons (From United States Department of Commerce)

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1925	67,312	55,638	64,619	66,360	59,232	55,693	65,220	56,511	58,098	75,039	63,895	63,144	750,761
1926	74,545	67,188	69,174	63,096	59,109	55,796	52,455	62,264	57,155	55,085	47,345	49,558	712,770
1927	61,597	68,767	66,376	64,427	57,311	54,456	53,484	51,368	46,161	48,062	43,202	57,579	672,790
1928	62,328	64,419	70,288	62,056	63,847	61,071	60,964	66,128	61,163	65,780	59,664	61,182	758,890
1929	76,787	77,976	86,744	80,777	76,949	65,315	61,358	62,541	52,647	61,164	40,145	43,476	785,878
1930	53,558	56,268	54,209	48,884	42,173	30,489	27,271	23,148	24,429	23,027	25,413	23,853	432,722
1931	29,688	30,003	32,424	33,926	26,111	21,110	18,160	17,754	16,907	17,524	17,413	18,125	279,145
1932	20,332	17,808	16,235	16,185	16,463	13,330	8,658	7,776	10,582	12,850	14,304	14,504	169,027
1933	12,645	11,273	12,508	18,449	24,671	31,997	28,458	28,323	22,744	19,933	20,830	26,166	257,997
1934	32,501	36,594	42,961	38,453	32,639	24,499	21,862	21,306	19,511	18,785	28,630	36,505	354,146
1935	44,568	41,225	40,237	37,394	31,136	25,668	25,526	35,602	35,658	45,246	47,778	42,573	452,611
1936	43,852	38,278	48,008	47,933	44,136	42,848	41,031	45,179	44,361	55,521	58,152	67,035	576,334
1937	54,070	60,187	68,502	62,940	46,018	43,141	41,353	49,376	41,652	34,810	28,170	19,753	549,972
1938	17,076	19,557	20,556	19,724	17,564	18,143	16,905	25,752	29,061	32,770	36,643	35,633	289,384
1939	38,105	33,234	35,997	29,183	27,702	29,041	29,892	40,005	64,732	63,835	.....	.....	.....

Annual Shipments of Lake Superior Iron Ore by Water, Gross Tons (Reported by Lake Superior Iron Ore Association)

	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
	51,107,136	53,980,874	65,204,000	46,582,982	23,467,786	3,567,985	21,623,898	22,249,600	28,362,368	44,822,023	62,598,836	19,263,011	45,072,725

Earnings of Steel Industry Employees, Cents per Hour

(1901 to 1919 from "Real Wages in United States," by Paul H. Douglas; 1920 on from National Industrial Conference Board and American Iron and Steel Institute. Data Cover Wage-Earning Employees Only)

1901.....23.8	1906.....25.5	1911.....27.3	1916.....37.1	1921.....52.2	1926.....63.6	1931.....63.6	1936.....66.8
1902.....25.4	1907.....26.4	1912.....28.3	1917.....46.2	1922.....50.4	1927.....64.4	1932.....53.1	1937.....81.8
1903.....25.8	1908.....23.9	1913.....30.6	1918.....57.7	1923.....59.6	1928.....64.7	1933.....52.4	1938.....83.0
1904.....24.0	1909.....24.5	1914.....29.8	1919.....65.3	1924.....63.6	1929.....65.4	1934.....62.8	1939.....84.0*
1905.....24.5	1910.....26.8	1915.....29.7	1920.....70.8	1925.....63.3	1930.....66.1	1935.....65.5	

* 10 months' average.

Monthly Average Pig Iron Prices Computed From

Composite Pig Iron

Average of THE IRON AGE quotations on basic pig iron at Buffalo, Valley and

	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920
Jan.....	\$22.06	\$13.47	\$15.95	\$17.30	\$23.24	\$16.84	\$15.68	\$17.12	\$13.63	\$12.65	\$16.49	\$12.76	\$12.38	\$17.81	\$28.88	\$33.21	\$31.36	\$39.39
Feb.....	21.47	13.17	15.84	17.10	23.33	16.30	15.35	16.77	13.83	12.61	16.31	13.18	12.38	17.76	29.75	33.21	31.36	42.35
March.....	21.54	13.43	15.98	17.10	23.02	15.97	15.03	16.29	13.88	12.93	16.07	13.16	12.34	18.06	32.18	33.21	30.10	42.24
April.....	20.93	13.65	15.68	17.03	23.03	15.55	14.38	15.97	13.79	13.09	15.74	13.13	12.37	18.15	38.56	32.71	27.11	43.01
May.....	19.54	13.19	15.63	17.07	23.97	15.16	14.38	15.27	13.53	13.27	14.98	13.06	12.37	18.08	41.87	32.71	26.91	43.64
June.....	18.83	12.66	15.04	16.94	23.47	15.35	14.71	14.90	13.27	13.36	14.35	12.97	12.45	17.91	47.95	32.71	26.46	44.09
July.....	17.79	11.84	14.37	16.96	22.51	14.91	15.18	14.72	13.21	13.68	13.99	12.92	12.55	17.79	52.11	32.73	26.37	45.44
Aug.....	16.98	12.07	14.64	17.68	21.82	15.05	15.52	14.39	13.12	14.15	13.93	12.91	13.55	17.63	51.43	32.73	26.83	47.38
Sept.....	16.03	12.07	14.94	18.59	20.55	15.03	16.41	14.17	12.99	14.74	13.97	12.83	14.28	17.82	46.93	32.73	27.11	47.83
Oct.....	15.02	12.67	15.61	19.52	19.88	14.79	17.25	13.79	12.84	16.01	13.93	12.67	14.67	19.18	33.21	34.31	27.62	45.05
Nov.....	14.23	14.37	17.01	22.17	18.66	15.21	17.46	13.74	12.71	16.52	13.39	12.42	15.82	24.36	33.21	34.36	30.34	38.65
Dec.....	13.75	15.77	17.10	22.82	17.52	15.73	17.26	13.78	12.59	16.63	13.06	12.39	17.34	28.63	33.21	34.26	36.13	34.51
Aver.....	18.18	13.80	15.65	18.86	21.75	15.49	15.72	15.08	13.88	14.14	14.68	12.87	13.54	19.43	39.11	33.24	28.96	42.76

Basic Pig Iron at Mahoning or Shenango Valley Furnace, Gross Ton

	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$25.80	\$21.25	\$22.00	\$20.00	\$18.00	\$17.00	\$17.50	\$18.50	\$17.00	\$15.00	\$13.50	\$17.00	\$18.00	\$19.00	\$20.50	\$23.50	\$20.50
Feb.....	26.25	22.00	22.00	20.00	18.00	17.00	17.50	18.50	16.75	14.62	13.50	17.00	18.00	19.00	20.75	23.50	20.50
March.....	30.13	21.94	21.30	20.00	18.40	17.00	17.50	18.50	16.50	14.50	13.50	17.00	18.00	19.00	23.10	23.50	20.50
April.....	31.05	21.55	20.13	18.63	19.00	16.88	17.90	18.50	16.50	14.50	13.50	17.25	18.00	19.00	23.50	23.50	20.50
May.....	29.00	20.50	18.81	18.38	18.20	16.30	18.38	18.50	16.25	14.20	14.20	18.00	18.00	19.00	23.50	23.50	20.50
June.....	27.38	19.63	18.05	18.00	17.88	15.45	18.50	18.50	15.50	14.00	15.00	18.00	18.00	19.00	23.50	22.70	20.50
July.....	25.10	19.00	18.00	17.63	17.50	16.00	18.50	18.10	15.50	13.50	15.50	18.00	18.00	19.00	23.50	19.50	20.50
Aug.....	24.75	19.00	18.00	17.50	17.30	16.00	18.50	18.00	15.50	13.50	16.20	18.00	18.00	19.00	23.50	19.50	20.50
Sept.....	24.88	19.00	18.30	17.50	17.06	16.19	18.50	17.60	15.50	13.50	17.00	18.00	18.00	19.00	23.50	19.75	21.50
Oct.....	23.50	19.00	18.63	18.00	17.00	17.10	18.50	17.00	15.25	13.50	17.00	18.00	18.00	19.00	23.50	20.50	22.50
Nov.....	20.88	19.13	19.88	18.50	17.00	17.50	18.50	17.00	15.00	13.50	17.00	18.00	19.00	19.25	23.50	20.50	22.50
Dec.....	21.00	20.90	20.00	18.50	17.00	17.50	18.50	17.00	15.00	13.50	17.00	18.00	19.00	20.00	23.50	20.50	22.50
Aver.....	25.81	20.24	19.59	18.55	17.70	16.66	18.19	17.98	15.85	13.98	15.84	17.69	18.17	19.10	22.99	21.70	21.09

No. 2 Foundry Pig Iron at Mahoning or Shenango Valley Furnace, Gross Ton

	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$27.00	\$22.50	\$22.38	\$20.50	\$18.50	\$17.25	\$17.50	\$18.50	\$17.00	\$15.50	\$14.50	\$17.50	\$18.50	\$19.50	\$21.00	\$24.00	\$21.00
Feb.....	27.50	23.00	22.00	20.50	18.50	17.25	17.50	18.50	16.75	15.12	14.50	17.50	18.50	19.50	21.25	24.00	21.00
March.....	30.50	23.00	21.10	20.50	18.50	17.25	17.75	18.50	16.50	15.00	14.50	17.50	18.50	19.50	23.60	24.00	21.00
April.....	31.00	21.80	20.13	19.00	18.50	17.25	18.00	18.50	17.00	15.00	14.50	17.75	18.50	19.50	24.00	24.00	21.00
May.....	30.20	20.75	19.13	18.88	18.50	17.20	18.50	18.50	17.00	14.70	14.70	18.50	18.50	19.50	24.00	24.00	21.00
June.....	27.63	19.63	18.30	17.96	18.13	16.75	18.50	18.50	17.00	14.50	15.50	18.50	18.50	19.50	24.00	23.20	21.00
July.....	25.50	19.00	18.50	17.69	18.00	16.65	18.50	18.10	17.00	14.50	16.00	18.50	18.50	19.50	24.00	20.00	21.00
Aug.....	24.88	19.13	18.50	17.50	17.60	16.50	18.50	18.00	17.00	14.50	16.70	18.50	18.50	19.50	24.00	20.00	21.00
Sept.....	24.75	19.00	18.80	17.63	17.50	16.88	18.50	17.80	17.00	14.50	17.50	18.50	18.50	19.50	24.00	20.25	22.00
Oct.....	23.60	19.50	19.13	18.50	17.50	17.10	18.50	17.13	16.63	14.50	17.50	18.50	18.50	19.50	24.00	21.00	23.00
Nov.....	21.88	19.50	20.39	19.00	17.45	17.63	18.50	17.00	16.00	14.50	17.50	18.50	19.50	19.75	24.00	21.00	23.00
Dec.....	22.00	21.20	20.50	18.80	17.25	17.70	18.50	17.00	15.70	14.50	17.50	18.50	19.50	20.50	24.00	21.00	23.00
Aver.....	26.87	20.78	19.90	18.87	18.00	17.12	18.25	18.00	16.72	14.75	15.91	18.19	18.67	19.60	23.49	22.20	21.59

Malleable Pig Iron at Mahoning or Shenango Valley Furnace, Gross Ton

	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$22.39	\$22.39	\$20.50	\$18.50	\$17.30	\$18.00	\$19.00	\$17.50	\$16.00	\$14.50	\$17.50	\$18.50	\$19.50	\$21.00	\$24.00	\$21.00
Feb.....	23.00	22.00	20.50	18.50	17.25	18.00	19.00	17.25	15.62	14.50	17.50	18.50	19.50	21.25	24.00	21.00
March.....	22.50	21.50	20.50	18.50	17.25	18.25	19.00	17.00	15.50	14.50	17.50	18.50	19.50	23.60	24.00	21.00
April.....	22.10	20.63	19.00	18.50	17.25	18.50	19.00	17.00	15.50	14.50	17.75	18.50	19.50	24.00	24.00	21.00
May.....	21.00	19.25	18.88	18.50	17.25	19.00	19.00	17.00	15.20	14.70	18.50	18.50	19.50	24.00	24.00	21.00
June.....	19.88	18.50	18.05	18.13	17.00	19.00	19.00	17.00	15.00	15.50	18.50	18.50	19.50	24.00	23.20	21.00
July.....	19.00	18.50	17.75	18.00	17.00	19.00	18.60	17.00	14.50	16.00	18.50	18.50	19.50	24.00	20.00	21.00
Aug.....	19.13	18.50	17.50	17.60	17.00	19.00	18.50	17.00	14.50	16.70	18.50	18.50	19.50	24.00	20.00	21.00
Sept.....	19.80	18.80	17.63	17.50	17.19	19.00	18.30	17.00	14.50	17.50	18.50	18.50	19.50	24.00	20.25	22.00
Oct.....	19.50	19.13	18.50	17.50	17.55	19.00	17.75	16.88	14.50	17.50	18.50	18.50	19.50	24.00	21.00	23.00
Nov.....	19.75	20.38	19.00	17.50	18.19	19.00	17.50	16.50	14.50	17.50	18.50	19.50	19.75	24.00	21.00	23.00
Dec.....	21.20	20.50	18.75	17.50	18.15	19.00	17.50	16.20	14.50	17.50	18.50	19.50	20.50	24.00	21.00	23.00
Aver.....	20.77	20.01	18.88	18.02	17.87	18.73	18.51	16.94	14.98	15.91	18.19	18.67	19.60	23.49	22.20	21.59

No. 2 Foundry Pig Iron at St. Louis and at Granite City,* Ill., Furnace, Gross Ton

	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$24.56	\$22.31	\$20.56	\$20.75	\$20.50	\$18.25	\$18.33	\$18.33	\$17.50	\$18.50	\$19.50	\$21.00	\$24.00	\$21.00
Feb.....	24.56	22.06	20.56	20.75	20.50	18.25	18.33	18.33	17.50	18.50	19.50	21.25	24.00	21.00
March.....	24.56	21.86	20.56	20.75	20.44	18.25	18.33	18.33	17.50	18.50	19.50	23.60	24.00	21.00
April.....	24.00	21.56	20.56	20.75	20.25	18.25	18.33	17.34	17.75	18.50	19.50	24.00	24.00	21.00
May.....	23.56	21.56	19.81	20.75	19.75	18.25	18.33	16.55	18.50	18.50	19.50	24.00	24.00	21.00
June.....	23.16	21.31	19.81	20.75	19.75	18.25	18.33	16.85	18.50	18.50	19.50	24.00	23.20	21.00
July.....	23.06	21.06	19.76	20.75	19.10	18.25	18.33	17.35	18.50	18.50	19.50	24.00	20.00	21.00
Aug.....	23.06	20.56	19.68	20.69	19.00	18.25	18.33	17.85	18.50	18.50	19.50	24.00	20.00	21.00
Sept.....	23.06	20.56	20.31	20.50	18.70	18.25	18.33	*17.50	18.50	18.50	19.50	24.00	20.25	22.00
Oct.....	22.56	20.56	20.56	20.50	18.25	18.25	18.33	17.50	18.50	18.70	19.50	24.00	21.00	23.00
Nov.....	22.36	20.56	20.87	20.50	18.25	18.25	18.33	17.50	18.50	19.50	19.75	24.00	21.00	23.00
Dec.....	22.56	20.56	20.81	20.50	18.25	18.25	18.33	17.50	18.50	19.50	20.50	24.00	21.00	23.00
Aver.....	\$23.42	\$21.21	\$20.33	\$20.66	\$19.39	\$18.25	\$18.33	\$17.58	\$18.19	\$18.68	\$19.60	\$23.49	\$22.20	\$21.59

Weekly Market Quotations In THE IRON AGE

Price, Per Gross Ton

Valley furnace and foundry iron at Chicago, Birmingham, Philadelphia.

	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan....	\$31.18	\$18.48	\$26.78	\$22.15	\$22.44	\$21.70	\$19.44	\$17.63	\$18.43	\$18.19	\$15.90	\$14.68	\$13.56	\$16.90	\$17.90	\$18.84	\$20.25	\$23.25	\$20.61
Feb....	28.45	18.14	27.20	22.84	22.50	21.77	19.07	17.73	18.38	18.02	15.80	14.51	13.56	16.90	17.90	18.84	20.50	23.25	20.61
March..	25.18	18.35	30.11	22.81	21.99	21.65	19.03	17.73	18.36	17.75	15.71	14.45	13.56	16.90	17.90	18.84	22.85	23.25	20.61
April...	23.73	20.00	30.83	22.31	20.95	20.96	19.21	17.67	18.52	17.73	15.79	14.35	13.76	17.07	17.90	18.84	23.25	23.25	20.61
May....	22.78	23.35	29.74	21.40	19.85	20.69	19.09	17.45	18.70	17.60	15.76	14.12	14.48	17.90	17.85	18.84	23.25	23.25	20.61
June...	21.73	23.95	28.23	20.27	19.22	20.00	18.92	17.23	18.65	17.48	15.62	14.01	15.01	17.90	17.84	18.84	23.25	22.98	20.61
July....	20.22	23.86	25.96	19.31	18.96	19.51	18.56	17.10	18.48	17.16	15.56	13.76	15.50	17.90	17.84	18.84	23.25	19.61	20.61
Aug....	18.97	26.69	25.19	19.40	19.01	19.46	18.17	17.11	18.39	16.90	15.51	13.69	16.09	17.90	17.84	18.73	23.25	19.61	20.61
Sept....	19.89	31.78	25.02	19.46	19.39	19.46	18.03	17.54	18.27	16.70	15.44	13.64	16.71	17.90	17.84	18.73	23.25	19.82	21.61
Oct....	19.97	30.57	23.30	19.46	19.92	19.69	17.96	17.94	18.33	16.31	15.21	13.63	16.61	17.90	17.87	18.73	23.25	20.57	22.61
Nov....	19.79	27.82	21.40	19.79	21.16	20.13	17.59	18.46	18.36	16.21	14.97	13.59	16.61	17.90	18.84	18.98	23.25	20.61	22.61
Dec....	19.11	25.70	21.88	21.60	21.54	19.94	17.55	18.51	18.24	15.95	14.86	13.56	16.90	17.90	18.84	19.73	23.25	20.61	22.61
Aver..	23.58	24.08	26.50	20.90	20.58	20.48	18.65	17.68	18.43	17.17	15.51	14.00	15.30	17.58	18.03	18.90	23.74	21.67	21.19

Eastern Pennsylvania No. 2X Foundry Pig Iron at Philadelphia, Gross Ton

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$21.34	\$29.76	\$24.11	\$25.01	\$24.26	\$22.76	\$20.56	\$21.76	\$21.26	\$18.26	\$16.14	\$13.84	\$19.51	\$20.51	\$21.56	\$23.01	\$25.84	\$22.84
Feb.....	21.09	30.01	24.04	25.01	24.14	22.26	21.14	21.76	21.26	18.26	16.14	13.34	19.51	20.51	21.56	23.26	25.84	22.84
March...	21.26	32.30	24.16	24.21	23.36	22.26	21.26	21.89	20.76	18.26	16.12	13.84	19.51	20.51	21.56	25.61	25.84	22.84
April....	23.62	32.95	23.06	22.82	23.26	22.26	21.26	22.26	20.76	18.26	16.09	14.59	19.76	20.51	21.56	26.01	25.84	22.84
May.....	26.09	32.76	22.67	21.51	22.89	22.26	21.26	22.26	20.39	17.76	15.34	15.99	20.51	20.55	21.56	26.01	25.84	22.84
June....	27.06	30.76	21.85	21.26	22.66	22.14	21.26	22.26	20.26	17.71	15.34	16.84	20.51	20.56	21.56	26.01	25.04	22.84
July.....	27.92	27.68	21.26	21.26	22.26	21.51	20.86	22.16	19.96	17.51	14.84	17.22	20.51	20.56	21.56	26.01	21.84	22.84
Aug.....	32.26	25.89	21.51	21.57	22.26	21.26	20.76	21.76	19.76	17.32	14.54	17.79	20.51	20.56	21.56	26.01	21.84	22.84
Sept....	34.83	26.26	21.76	21.96	22.26	20.76	21.01	21.76	19.56	16.86	14.34	18.59	20.51	20.56	21.56	26.01	21.84	23.84
Oct.....	32.54	24.04	21.76	22.64	22.26	20.51	21.26	21.76	19.26	16.64	14.28	18.51	20.51	20.56	21.56	26.01	22.59	24.84
Nov.....	30.39	23.01	22.64	23.64	23.56	20.26	21.64	21.76	19.01	16.07	14.09	18.51	20.51	21.56	21.81	26.01	22.84	24.84
Dec.....	28.86	24.26	24.56	24.26	23.39	20.26	21.76	21.46	18.26	16.01	13.84	19.51	20.51	21.56	22.56	26.06	22.84	24.84
Aver....	\$27.87	\$28.31	\$28.78	\$28.93	\$28.05	\$21.55	\$21.17	\$21.90	\$20.04	\$17.41	\$15.09	\$16.55	\$20.30	\$20.71	\$21.66	\$25.50	\$24.00	\$23.48

Basic Pig Iron at Philadelphia, Gross Ton

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan....	\$20.18	\$27.80	\$23.00	\$24.25	\$23.00	\$21.50	\$19.50	\$19.75	\$19.50	\$17.25	\$16.25	\$13.50	\$18.76	\$19.76	\$20.81	\$22.26	\$25.34	\$22.34
Feb....	19.84	28.19	22.69	23.88	23.00	21.19	19.50	19.88	19.44	17.25	16.25	13.50	18.76	19.76	20.81	22.51	25.34	22.34
March..	22.61	29.56	21.81	23.65	22.10	20.85	19.50	20.25	19.06	17.25	16.00	13.50	18.76	19.76	20.81	24.86	25.34	22.34
April... 21.00	30.81	21.50	22.31	21.75	20.75	19.50	20.25	18.90	17.13	16.00	14.09	18.91	19.76	20.81	25.28	25.34	22.34	
May.... 24.00	30.60	21.00	21.13	21.75	20.75	19.10	20.25	18.75	17.00	16.00	15.29	19.76	19.79	20.81	25.28	25.34	22.34	
June... 25.00	28.14	21.00	21.50	21.45	20.75	19.00	20.25	18.75	17.00	16.00	16.09	19.76	19.81	20.81	25.28	24.54	22.34	
July.... 25.75	26.60	20.20	21.50	21.00	20.75	18.95	20.20	18.45	16.75	15.50	16.59	19.76	19.81	20.81	25.28	21.34	22.34	
Aug.... 27.23	25.00	20.00	20.60	20.95	20.15	18.75	19.75	18.25	16.75	14.20	17.24	19.76	19.81	20.81	25.28	21.34	22.34	
Sept.... 30.83	25.00	20.00	20.70	20.75	20.00	18.88	19.75	18.15	16.75	13.50	17.84	19.76	19.81	20.81	25.28	21.34	23.34	
Oct.... 29.30	24.20	20.00	21.25	20.69	20.00	19.45	19.75	17.75	16.75	13.50	17.76	19.76	19.81	20.81	25.28	22.09	24.34	
Nov.... 27.83	22.88	21.13	22.39	22.60	19.60	19.75	19.75	17.75	16.39	13.50	17.76	19.76	20.81	21.06	25.28	22.34	24.34	
Dec.... 27.31	23.13	23.41	23.00	22.00	19.25	20.05	19.55	17.75	16.25	13.50	18.76	19.76	20.81	21.81	25.31	22.34	24.34	
Aver..	\$5.08	\$6.53	\$1.31	\$2.16	\$1.75	\$0.46	\$1.33	\$1.95	\$1.84	\$1.87	\$1.08	\$1.59	\$1.45	\$1.96	\$0.91	\$4.75	\$3.50	\$2.93

No. 2 Foundry Pig Iron at Cleveland Furnace, Gross Ton

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$20.06	\$27.37	\$23.20	\$23.37	\$21.82	\$19.00	\$18.00	\$19.00	\$19.00	\$17.50	\$16.00	\$15.00	\$17.50	\$18.50	\$19.50	\$21.00	\$24.00	\$21.00
Feb.....	20.06	28.50	24.00	23.49	21.88	18.63	18.00	19.00	19.00	17.50	16.00	15.00	17.50	18.50	19.50	21.25	24.00	21.00
March...	21.55	31.65	24.00	23.97	21.31	19.40	18.00	19.00	19.00	17.20	15.70	15.00	17.50	18.50	19.50	23.60	24.00	21.00
April...	20.81	32.02	23.75	22.32	20.35	19.37	18.00	19.00	18.88	17.00	15.50	15.00	18.00	18.50	19.50	24.00	24.00	21.00
May.....	23.75	31.71	22.75	20.37	19.50	19.00	18.00	19.00	18.50	17.00	15.50	15.30	18.50	18.50	19.50	24.00	24.00	21.00
June....	24.06	29.96	21.00	19.62	19.19	18.70	17.88	19.00	18.50	17.00	15.50	15.50	18.50	18.50	19.50	24.00	23.20	21.00
July.....	24.75	26.94	19.75	19.50	19.00	18.50	17.50	19.00	18.00	17.00	15.50	16.00	18.50	18.50	19.50	24.00	20.00	21.00
Aug.....	31.31	25.00	20.06	19.50	19.00	18.50	17.50	19.00	18.00	17.00	15.50	16.70	18.50	18.50	19.50	24.00	20.00	21.00
Sept....	35.94	25.37	20.31	19.50	19.00	18.50	17.88	19.00	17.60	17.00	15.00	17.50	18.50	18.50	19.50	24.00	20.25	22.00
Oct.....	33.59	24.75	20.50	20.05	19.37	18.38	18.13	19.00	17.50	17.00	15.00	17.50	18.50	18.50	19.50	24.00	21.00	23.00
Nov.....	29.97	22.85	20.81	21.82	20.10	18.00	19.00	19.00	17.50	17.00	15.00	17.50	18.50	19.50	19.75	24.00	21.00	23.00
Dec.....	26.85	22.56	21.88	21.76	19.88	18.00	19.00	19.00	17.50	16.60	15.00	17.50	18.50	19.50	20.50	24.00	21.00	23.00
Aver....	\$26.05	\$27.47	\$21.84	\$21.19	\$20.05	\$18.67	\$18.16	\$19.00	\$18.35	\$17.07	\$15.43	\$16.13	\$18.21	\$18.67	\$19.60	\$23.49	\$22.90	\$21.59

No. 2 Foundry Pig Iron at Buffalo Furnace, Gross Ton

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan....	\$19.44	\$26.94	\$22.25	\$23.00	\$21.00	\$18.50	\$17.00	\$18.00	\$18.75	\$17.50	\$16.00	\$16.00	\$17.50	\$18.50	\$19.50	\$21.00	\$24.00	\$21.00
Feb....	18.87	27.56	22.25	22.75	21.00	17.39	17.00	18.39	18.50	17.50	16.00	16.00	17.50	18.50	19.50	21.25	24.00	21.00
March..	18.30	29.05	21.81	22.12	21.00	17.05	17.00	18.50	18.50	17.50	16.00	16.00	17.50	18.50	19.50	23.60	24.00	21.00
April...	20.81	29.56	21.37	20.65	21.00	17.50	17.00	18.50	18.50	17.50	16.00	16.00	17.50	18.50	19.50	24.00	24.00	21.00
May....	22.62	29.40	20.25	19.00	20.75	17.50	17.00	18.50	18.50	17.13	16.00	16.00	18.50	18.50	19.50	24.00	24.00	21.00
June... 23.05	29.06	19.37	19.00	19.60	17.39	17.00	18.75	18.50	17.00	16.00	16.00	18.50	18.50	19.50	24.00	23.20	21.00	
July.... 24.60	26.00	19.00	18.85	19.00	16.94	17.00	19.50	18.50	17.00	16.00	16.50	18.50	18.50	19.50	24.00	20.00	21.00	
Aug.... 30.70	24.95	19.19	18.72	19.00	16.20	17.00	19.50	18.50	17.00	16.00	17.10	18.50	18.50	19.50	24.00	20.00	21.00	
Sept.... 33.94	24.87	19.37	18.75	19.00	16.25	17.00	19.50	18.50	17.00	16.00	17.50	18.50	18.50	19.50	24.00	20.13	22.00	
Oct.... 31.12	23.06	19.05	19.40	19.00	16.88	17.10	19.50	17.75	17.00	16.00	17.50	18.50	18.50	19.50	24.00	20.88	23.00	
Nov.... 27.80	20.87	20.50	21.19	19.00	17.00	17.88	19.50	17.50	17.00	16.00	17.50	18.50	19.50	19.75	24.00	21.00	23.00	
Dec.... 25.50	21.56	22.62	21.50	19.00	17.00	18.00	19.50	17.50	16.80	16.00	17.50	18.50	19.50	20.50	24.00	21.00	23.00	
Aver...	24.72	26.07	20.59	20.41	19.86	17.13	17.17	18.97	18.29	17.16	16.00	16.63	18.17	18.67	19.60	23.49	22.18	21.59

No. 2 Foundry Pig Iron at Chicago Furnace, Gross Ton

	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$28.90	\$23.70	\$24.00	\$23.00	\$20.88	\$18.50	\$20.00	\$20.00	\$17.50	\$16.50	\$15.50	\$17.50	\$18.50	\$19.50	\$21.00	\$24.00	\$21.00
Feb.....	29.75	24.50	24.00	23.00	20.25	18.50	20.00	20.00	17.50	16.50	15.50	17.50	18.50	19.50	21.25	24.00	21.00
March.....	31.25	24.38	23.80	23.00	20.00	18.50	20.00	19.50	17.50	16.50	15.50	17.50	18.50	19.50	23.60	24.00	21.00
April.....	32.00	24.10	22.50	22.00	20.00	18.50	20.00	19.40	17.50	16.00	15.50	17.75	18.50	19.50	24.00	24.00	21.00
May.....	32.00	22.75	21.13	21.63	20.00	18.20	20.00	19.00	17.50	16.00	15.80	18.50	18.50	19.50	24.00	24.00	21.00
June.....	31.25	21.25	20.30	21.10	20.00	18.00	20.00	18.39	17.50	16.00	16.00	18.50	18.50	19.50	24.00	23.20	21.00
July.....	27.90	19.60	20.50	21.00	20.00	17.60	20.00	17.90	17.50	15.50	16.78	18.50	18.50	19.50	24.00	20.00	21.00
Aug.....	27.00	20.38	20.50	21.00	19.50	17.63	20.00	17.60	17.50	15.50	17.10	18.50	18.50	19.50	24.00	20.00	21.00
Sept.....	26.75	20.50	21.00	21.00	19.50	18.25	20.00	17.50	17.50	15.50	17.50	18.50	18.50	19.50	24.00	20.25	22.00
Oct.....	25.00	20.50	21.63	21.00	19.00	18.80	20.00	17.50	17.00	15.50	17.50	18.50	18.70	19.50	24.00	21.00	23.00
Nov.....	23.13	21.00	22.75	21.00	18.50	20.00	20.00	17.50	17.00	15.50	17.50	18.50	19.50	19.75	24.00	21.00	23.00
Dec.....	23.00	22.50	23.00	21.00	18.50	20.00	20.00	17.50	16.70	15.50	17.50	18.50	19.50	20.50	24.00	21.00	23.00
Aver.....	\$8.16	\$2.10	\$2.09	\$1.64	19.68	18.54	\$0.00	18.47	17.35	15.87	16.47	18.19	18.68	19.60	\$3.49	\$2.80	\$1.59

Malleable Pig Iron at Chicago Furnace, Gross Ton

	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$28.90	\$23.88	\$24.00	\$23.00	\$20.88	\$18.50	\$20.00	\$20.00	\$17.50	\$16.50	\$15.50	\$17.50	\$18.50	\$19.50	\$21.00	\$24.00	\$21.00
Feb.....	29.75	24.50	24.00	23.00	20.25	18.50	20.00	20.00	17.50	16.50	15.50	17.50	18.50	19.50	21.25	24.00	21.00
March.....	31.25	24.38	24.00	23.00	20.00	18.50	20.00	19.60	17.50	16.50	15.50	17.50	18.50	19.50	23.60	24.00	21.00
April.....	32.00	24.10	22.63	22.00	20.00	18.50	20.00	19.40	17.50	16.00	15.50	17.75	18.50	19.50	24.00	24.00	21.00
May.....	32.00	22.75	21.25	21.42	20.00	18.22	20.00	19.00	17.50	16.00	15.80	18.50	18.50	19.50	24.00	24.00	21.00
June.....	31.25	21.25	20.60	21.10	20.00	18.00	20.00	18.50	17.50	16.00	16.00	18.50	18.50	19.50	24.00	23.20	21.00
July.....	27.90	19.60	20.50	21.00	20.00	17.60	20.00	17.90	17.50	15.50	16.78	18.50	18.50	19.50	24.00	20.00	21.00
Aug.....	27.00	20.38	20.50	21.00	19.50	17.63	20.00	17.50	17.50	15.50	17.10	18.50	18.50	19.50	24.00	20.00	21.00
Sept.....	26.75	20.50	21.00	21.00	19.50	18.25	20.00	17.50	17.50	15.50	17.50	18.50	18.50	19.50	24.00	20.25	22.00
Oct.....	25.00	20.50	21.63	21.00	19.00	18.80	20.00	17.50	17.10	15.50	17.50	18.50	18.70	19.50	24.00	21.00	23.00
Nov.....	23.13	20.88	22.75	21.00	18.50	20.00	20.00	17.50	17.00	15.50	17.50	18.50	19.50	19.75	24.00	21.00	23.00
Dec.....	23.00	22.62	23.00	21.00	18.50	20.00	20.00	17.50	16.70	15.50	17.50	18.50	19.50	20.50	24.00	21.00	23.00
Aver.....	\$8.16	\$2.11	\$2.15	\$1.65	19.68	18.54	\$0.00	18.48	17.36	15.87	16.47	18.19	18.68	19.60	\$3.49	\$2.80	\$1.59

Lake Superior Charcoal Pig Iron at Chicago, Gross Ton

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan...	\$31.10	\$33.15	\$29.15	\$29.04	\$29.04	\$27.04	\$27.04	\$27.04	\$27.04	\$27.04	\$23.17	\$23.17	\$23.54	\$24.04	\$25.25	\$26.54	\$30.24	\$28.34
Feb...	29.38	33.90	29.15	29.04	29.04	27.04	27.04	27.04	27.04	27.04	23.17	23.17	23.54	24.04	25.25	26.79	30.24	28.34
March...	26.00	35.40	29.15	29.04	29.04	27.04	27.04	27.04	25.04	26.24	23.17	23.17	23.54	24.04	25.25	29.44	30.24	28.34
April...	26.50	36.53	29.15	29.04	29.04	27.04	27.04	27.04	25.04	26.24	23.17	23.17	24.79	24.13	25.25	30.04	30.32	28.34
May...	28.40	36.65	29.15	29.04	29.04	27.04	27.04	27.04	25.04	26.24	23.17	23.17	24.04	24.25	25.25	30.04	30.34	28.34
June...	29.75	36.65	29.12	29.04	29.04	27.04	27.04	27.04	25.04	26.24	23.17	23.17	24.04	24.25	25.25	30.04	30.34	28.34
July...	31.65	34.81	29.04	29.04	29.04	27.04	27.04	27.04	25.04	26.24	23.17	23.17	24.04	24.25	25.25	30.04	28.34	28.34
Aug...	34.05	32.04	29.04	29.04	29.04	27.04	27.04	27.04	25.04	26.24	23.17	23.17	24.04	24.25	25.25	30.04	28.34	28.34
Sept...	36.15	32.04	29.04	29.04	29.04	27.04	27.04	27.04	25.04	26.24	23.17	23.17	24.04	24.25	25.25	30.04	28.34	28.34
Oct...	36.15	29.86	29.04	29.04	27.54	27.04	27.04	27.04	25.04	26.24	23.17	23.54	24.04	24.65	25.25	30.04	28.34	30.34
Nov...	36.15	28.40	29.04	29.04	27.54	27.04	27.04	27.04	25.04	26.24	23.17	23.54	24.04	24.65	25.25	30.16	28.34	30.34
Dec...	34.65	29.15	29.04	29.04	27.04	27.04	27.04	27.04	25.04	26.24	23.17	23.54	24.04	25.25	26.25	30.24	28.34	30.34
Aver...	\$1.60	\$3.88	\$9.09	\$9.04	\$8.58	\$7.04	\$7.04	\$7.04	\$6.87	\$5.31	\$3.17	\$3.50	\$3.98	\$4.55	\$5.35	\$9.45	\$9.31	\$8.98

Southern No. 2 Foundry Pig Iron at Birmingham, Gross Ton

	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$23.25	\$21.50	\$20.00	\$22.00	\$18.50	\$16.00	\$16.50	\$14.50	\$13.80	\$11.50	\$11.00	\$13.50	\$14.50	\$15.50	\$17.38	\$20.38	\$17.38
Feb.....	24.38	22.50	20.00	22.00	18.00	16.00	16.50	14.63	12.88	11.00	11.00	13.50	14.50	15.50	17.63	20.38	17.38
March.....	26.40	22.60	20.00	22.00	18.00	16.00	16.00	14.50	12.38	11.00	11.00	13.50	14.50	15.50	19.98	20.38	17.38
April.....	27.00	22.30	20.00	22.00	18.00	16.00	15.40	14.00	12.00	11.00	11.25	13.50	14.50	15.50	20.38	20.38	17.38
May.....	26.85	21.50	20.00	22.00	18.00	15.70	15.00	14.00	12.00	11.00	12.00	14.30	14.50	15.50	20.38	20.38	17.38
June.....	25.75	20.00	19.60	21.20	18.00	15.88	15.00	14.00	12.00	11.00	12.00	14.50	14.50	15.50	20.38	19.58	17.38
July.....	25.00	18.00	18.00	21.00	17.44	15.50	14.63	14.00	12.00	11.00	12.50	14.50	14.50	15.50	20.38	16.38	17.38
Aug.....	22.70	17.50	18.00	21.00	17.25	15.69	14.50	14.00	12.00	11.00	13.10	14.50	14.50	*15.88	20.38	16.38	17.38
Sept.....	22.75	17.50	18.50	20.75	17.25	16.25	14.50	14.00	12.00	11.00	13.50	14.50	14.50	15.88	20.38	16.63	18.28
Oct.....	20.63	17.50	19.38	20.00	17.25	16.25	14.50	14.00	12.00	11.00	13.50	14.50	14.50	15.88	20.38	17.38	19.38
Nov.....	19.60	17.75	21.00	20.00	16.00	16.39	14.50	14.00	12.00	11.00	13.50	14.50	14.75	18.13	20.38	17.38	19.38
Dec.....	21.00	19.80	22.00	20.00	16.00	16.50	14.50	14.00	12.00	11.00	13.50	14.50	15.50	16.88	20.38	17.38	19.38
Aver.....	\$3.86	19.86	19.71	\$1.10	17.47	16.01	15.18	14.14	12.27	11.04	12.32	14.15	14.60	15.76	19.87	18.68	17.96

*Commencing August, 1936, 38c. a ton deducted for 0.70 phosphorus and over.

Southern No. 2 Foundry Pig Iron at Cincinnati, Gross Ton

	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$27.45	\$25.55	\$24.05	\$25.69	\$22.19	\$19.69	\$20.19	\$17.69	\$14.19	\$14.07	\$13.82	\$18.13	\$19.13	\$20.20	\$20.69	\$23.89	\$21.06
Feb.....	28.68	26.55	24.05	25.69	21.69	19.69	20.19	17.19	14.19	13.82	13.82	18.13	19.13	20.20	20.94	23.89	21.06
March.....	30.80	26.55	24.05	25.69	21.69	19.69	19.69	16.69	14.19	13.82	13.82	18.13	19.13	20.20	23.29	23.89	21.06
April.....	31.05	26.35	24.05	25.69	21.69	19.69	19.09	16.69	14.19	13.82	14.32	18.13	19.13	20.20	23.69	23.89	21.06
May.....	30.75	25.55	24.05	25.69	21.69	19.39	18.69	16.69	14.69	13.82	15.96	19.13	19.13	20.20	23.69	23.89	21.06
June.....	29.30	24.05	23.25	24.59	21.69	19.56	18.69	16.69	14.69	13.82	16.51	19.13	19.20	20.20	23.69	23.12	21.06
July.....	28.85	22.05	22.18	24.19	21.13	19.19	17.99	16.39	14.69	13.82	17.01	19.13	19.20	20.20	23.69	20.06	21.06
Aug.....	27.68	21.55	22.55	24.19	20.94	19.39	17.57	15.82	14.69	13.82	17.83	19.13	19.20	19.44	23.69	20.06	21.06
Sept.....	26.55	21.55	22.85	24.07	20.94	19.94	17.19	15.49	14.69	13.82	18.23	19.13	19.20	19.44	23.69	20.31	22.06
Oct.....	24.68	21.55	23.43	23.69	20.94	19.94	17.30	15.19	14.69	13.82	18.13	19.13	19.20	19.44	23.69	21.06	23.06
Nov.....	23.65	21.80	24.87	23.69	19.69	20.87	17.69	14.94	14.69	13.82	18.13	19.13	19.20	19.69	23.81	21.06	23.06
Dec.....	25.05	23.85	25.49	23.69	19.69	20.19	17.69	14.39	14.69	13.82	18.13	19.13	19.20	20.44	23.89	21.06	23.06
Aver.....	\$7.87	\$5.91	\$5.74	\$4.71	\$1.16	\$9.70	\$8.51	\$6.16	\$4.52	\$5.84	\$6.31	\$8.80	\$9.34	\$9.99	\$5.20	\$2.18	\$1.64

Ferroatloy Quotations

Ferromanganese (80 Per Cent), Gross Ton at Seaboard

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan...	\$58.35	\$105.00	\$108.70	\$112.50	\$115.00	\$100.00	\$100.00	\$105.00	\$100.00	\$80.00	\$75.00	\$68.00	\$85.00	\$85.00	\$75.00	\$80.00	\$102.50	\$85.00
Feb...	60.42	107.50	107.50	115.00	115.00	100.00	100.00	105.00	95.50	80.00	75.00	68.00	85.00	85.00	75.00	80.00	102.50	80.00
March...	62.50	113.75	107.50	115.00	97.60	100.00	100.00	105.00	94.00	80.00	75.00	68.00	85.00	85.00	75.00	89.00	102.50	80.00
April...	64.37	120.00	107.50	115.00	88.00	100.00	100.00	105.00	94.00	80.00	75.00	68.00	85.00	85.00	75.00	95.00	102.50	80.00
May...	66.87	128.00	107.50	115.00	88.00	94.00	103.00	105.00	94.00	80.00	75.00	68.00	85.00	85.00	75.00	100.82	102.50	80.00
June...	67.50	128.75	107.50	115.00	88.00	90.00	105.00	105.00	94.00	80.00	68.00	68.00	85.00	85.00	75.00	102.50	102.50	80.00
July...	67.50	*119.50	106.50	115.00	88.00	90.00	105.00	105.00	94.00	80.00	68.00	82.00	85.00	85.00	75.00	102.50	92.50	80.00
Aug...	67.50	117.50	95.75	115.00	88.00	90.00	105.00	105.00	94.00	80.00	68.00	82.00	85.00	85.00	75.00	102.50	92.50	80.00
Sept...	75.63	*111.25	90.00	115.00	88.00	90.00	105.00	105.00	94.00	80.00	68.00	82.00	85.00	85.00	75.00	102.50	92.50	95.00
Oct...	100.00	*110.00	90.00	115.00	88.00	90.00	105.00	105.00	94.00	80.00	68.00	82.00	85.00	85.00	75.00	102.50	92.50	100.00
Nov...	100.00	*108.75	98.75	115.00	96.60	90.00	105.00	105.00	94.00	80.00	68.00	82.00	85.00	85.00	80.00	102.50	92.50	100.00
Dec...	100.00	*108.25	107.00	115.00	100.00	100.00	105.00	105.00	82.80	73.80	68.00	82.00	85.00	85.00	80.00	102.50	92.50	100.00
Aver.	74.28	114.85	108.85	114.79	95.08	94.50	103.17	105.00	93.70	79.47	70.98	75.00	85.00	85.00	75.83	90.84	97.80	88.67

*Price at furnace, where lower than price at seaboard.

Spiegeleisen (19 to 21 Per Cent), Gross Ton at Furnace

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan...	\$26.00	\$34.40	\$38.00	\$33.00	\$32.00	\$37.00	\$30.80	\$31.00	\$31.00	\$28.00	\$26.00	\$24.00	\$27.00	\$26.00	\$26.00	\$26.00	\$33.00	\$28.00
Feb...	38.00	35.50	38.00	33.00	32.00	37.00	31.00	31.00	31.00	28.00	26.00	24.00	27.00	26.00	26.00	26.00	33.00	28.00
March...	29.40	40.00	38.00	33.00	32.00	37.00	31.00	31.00	31.00	28.00	26.00	24.00	27.00	26.00	26.00	26.00	33.00	28.00
April...	32.25	45.00	36.80	33.00	32.00	37.00	31.00	31.00	31.00	28.00	26.00	24.00	27.00	26.00	26.00	26.00	33.00	28.00
May...	35.00	52.50	36.00	33.00	32.00	36.25	31.00	31.00	31.00	28.00	26.00	24.00	27.00	26.00	26.00	26.00	33.00	28.00
June...	36.00	48.50	35.00	32.80	32.00	35.50	31.00	31.00	31.00	28.00	25.75	24.00	26.00	26.00	26.00	33.00	33.00	28.00
July...	36.00	44.00	34.20	32.00	32.00	33.50	31.00	31.00	31.00	28.00	25.00	27.00	26.00	26.00	26.00	33.00	28.00	28.00
Aug...	37.80	46.75	32.50	32.00	32.00	33.00	32.50	31.00	31.00	28.00	25.00	27.00	26.00	26.00	26.00	33.00	28.00	28.00
Sept...	38.25	43.75	31.40	31.80	32.00	33.00	33.00	31.00	31.00	28.00	25.00	27.00	26.00	26.00	26.00	33.00	28.00	31.00
Oct...	38.00	43.75	30.75	31.25	32.00	30.75	33.00	31.00	31.00	28.00	25.00	27.00	26.00	26.00	26.00	33.00	28.00	32.00
Nov...	37.50	41.25	30.25	32.00	37.40	30.00	30.00	31.00	30.50	28.00	24.40	27.00	26.00	26.00	26.00	33.00	28.00	32.00
Dec...	37.50	39.00	32.00	32.00	36.50	30.00	31.00	31.00	28.40	26.20	24.00	27.00	26.00	26.00	26.00	33.00	28.00	32.00
Aver.	34.81	48.87	34.41	33.40	33.83	34.17	31.36	31.00	30.74	27.85	25.35	25.50	26.31	26.00	26.00	31.14	30.50	29.55

50 Per Cent Ferrosilicon, Carloads, Gross Ton, Delivered East of Mississippi River

	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan...	\$82.50	\$75.00	\$82.50	\$85.00	\$85.00	\$83.50	\$83.50	\$83.50	\$83.50	\$77.50	\$74.50	\$77.50	\$77.50	\$77.50	\$69.50	\$69.50	\$69.50
Feb...	83.75	75.00	82.50	85.00	85.00	83.50	83.50	83.50	83.50	77.50	74.50	77.50	77.50	77.50	69.50	69.50	69.50
March...	90.00	75.00	82.50	85.00	85.00	83.50	83.50	83.50	83.50	77.50	74.50	77.50	77.50	77.50	69.50	69.50	69.50
April...	92.50	75.00	82.50	85.00	85.00	83.50	83.50	83.50	83.50	77.50	74.50	77.50	77.50	77.50	69.50	69.50	69.50
May...	94.50	75.00	82.50	85.00	85.00	83.50	83.50	83.50	83.50	77.50	74.50	77.50	77.50	77.50	69.50	69.50	69.50
June...	90.00	75.00	82.50	85.00	85.00	83.50	83.50	83.50	83.50	77.50	74.50	77.50	77.50	77.50	69.50	69.50	69.50
July...	82.50	71.00	82.50	85.00	85.00	83.50	83.50	83.50	83.50	77.50	74.50	77.50	77.50	77.50	69.50	69.50	69.50
Aug...	82.50	71.25	82.50	85.00	85.00	83.50	83.50	83.50	83.50	77.50	74.50	77.50	77.50	77.50	69.50	69.50	69.50
Sept...	82.50	72.00	82.50	85.00	85.00	83.50	83.50	83.50	83.50	77.50	74.50	77.50	77.50	77.50	69.50	69.50	69.50
Oct...	81.00	71.00	82.50	85.00	85.00	83.50	83.50	83.50	83.50	77.50	74.50	77.50	77.50	77.50	69.50	69.50	69.50
Nov...	80.63	70.00	82.50	85.00	85.00	83.50	83.50	83.50	83.50	77.50	74.50	77.50	77.50	77.50	69.50	69.50	69.50
Dec...	76.25	75.00	82.50	85.00	85.00	83.50	83.50	83.50	83.50	77.50	74.50	77.50	77.50	77.50	69.50	69.50	69.50
Aver.	84.89	75.38	82.60	85.00	84.00	83.60	83.50	83.50	83.50	77.50	74.50	77.50	77.50	77.50	69.50	69.50	69.50

Coke Prices

Prompt Connellsville Furnace Coke, Net Ton at Oven

	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan...	\$6.65	\$6.00	\$5.06	\$2.75	\$8.05	\$3.94	\$3.94	\$7.19	\$3.50	\$2.70	\$2.75	\$2.55	\$2.50	\$2.25	\$1.75	\$3.60	\$3.85	\$3.85	\$4.00	\$4.00	\$3.75
Feb...	4.44	6.00	4.50	3.04	7.13	4.08	3.63	7.31	3.38	2.68	2.90	2.60	2.50	2.25	1.75	3.50	3.85	3.85	4.00	4.00	3.75
March...	4.06	6.00	4.35	3.25	7.25	4.08	3.35	3.05	3.35	2.60	2.98	2.60	2.50	2.25	1.75	3.50	3.85	3.85	4.25	4.00	3.75
April...	3.65	9.60	3.50	4.48	6.31	3.75	3.04	3.00	3.20	2.60	2.78	2.60	2.50	2.25	1.75	3.85	3.85	3.85	4.51	4.00	3.75
May...	3.69	12.00	3.25	6.00	5.15	3.25	3.00	2.91	2.94	2.60	2.75	2.53	2.45	2.20	1.75	3.85	3.85	3.85	4.60	4.00	3.75
June...	4.00	15.00	3.00	6.75	4.75	3.19	2.77	2.83	2.93	2.60	2.75	2.50	2.40	2.00	1.81	3.85	3.59	3.65	4.58	3.85	3.75
July...	4.07	17.20	2.81	10.75	4.55	3.00	2.83	2.84	3.00	2.63	2.75	2.50	2.40	2.00	2.31	3.85	3.27	3.50	4.35	3.75	3.75
Aug...	4.31	17.75	2.75	12.80	4.56	3.00	3.06	2.95	3.00	2.75	2.73	2.58	2.40	2.00	2.55	3.85	3.29	3.61	4.35	3.75	3.75
Sept...	4.56	16.70	3.15	11.13	4.50	3.00	3.49	3.38	2.85	2.75	2.65	2.60	2.40	2.00	2.50	3.85	3.25	3.69	4.27	3.75	4.25
Oct...	4.52	15.12	3.28	9.60	3.85	3.00	6.13	3.63	2.85	2.83	2.65	2.60	2.40	1.81	3.50	3.85	3.53	3.75	4.25	3.75	4.25
Nov...	5.87	8.26	3.03	7.19	3.81	3.04	5.75	4.43	2.77	2.75	2.65	2.53	2.40	1.75	3.75	3.85	3.60	3.75	4.25	3.75	5.00
Dec...	6.12	6.20	2.75	7.00	4.00	3.68	4.32	3.50	2.75	2.75	2.63	2.50	2.34	1.75	3.75	3.85	3.57	3.92	4.00	3.75	5.00
Aver.	4.68	11.38	3.45	7.01	5.33	3.48	3.78	3.98	3.04	2.69	2.75	2.58	2.43	2.04	2.41	3.79	3.61	3.68	4.29	3.86	4.09

Prompt Connellsville Foundry Coke, Net Ton at Oven

	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan....	\$6.25	\$7.00	\$6.38	\$3.75	\$8.70	\$4.75	\$4.88	\$7.75	\$4.50	\$3.75	\$3.75	\$3.50	\$3.50	\$3.50	\$2.50	\$4.25	\$4.60	\$4.25	\$4.50	\$5.00	\$4.75
Feb....	5.00	7.00	5.63	4.00	8.25	4.88	4.31	8.31	4.31	3.75	3.75	3.50	3.50	3.50	2.50	4.25	4.60	4.25	4.50	5.00	4.75
March..	4.94	7.00	5.45	4.25	8.38	4.88	4.15	4.40	4.40	3.75	3.75	3.50	3.50	3.50	2.50	4.25	4.60	4.25	4.50	5.00	4.75
April..	4.30	10.20	4.75	5.06	7.56	4.75	4.00	4.06	4.06	3.75	3.75	3.50	3.50	3.50	2.50	4.60	4.60	4.25	5.00	5.00	4.75
May....	4.31	13.00	4.50	6.30	6.15	4.69	4.00	4.00	4.00	3.75	3.75	3.50	3.50	3.10	2.50	4.60	4.60	4.25	5.25	5.00	4.75
June...	4.56	15.75	4.45	7.25	5.56	4.38	4.80	4.00	4.00	3.75	3.75	3.50	3.50	3.00	2.56	4.60	4.15	4.25	5.25	4.85	4.75
July...	5.00	17.80	4.06	11.00	5.35	4.10	3.75	4.00	4.00	3.75	3.75	3.50	3.50	3.00	2.94	4.60	3.88	4.00	5.00	4.75	4.75
Aug....	5.25	18.88	3.75	13.90	5.38	4.00	3.88	4.00	4.00	3.75	3.75	3.50	3.50	2.90	3.15	4.60	4.00	4.00	5.00	4.75	4.75
Sept...	5.80	17.70	4.15	12.50	5.50	4.00	4.25	4.38	4.00	3.75	3.75	3.50	3.50	2.75	3.25	4.60	4.00	4.05	5.00	4.75	5.12
Oct....	6.25	17.38	4.38	11.70	4.80	4.00	6.31	4.63	4.00	3.75	3.75	3.50	3.50	2.75	4.05	4.60	4.20	4.25	5.00	4.75	5.65
Nov....	7.00	9.50	4.19	8.38	4.81	4.06	6.81	5.50	3.85	3.75	3.75	3.50	3.50	2.75	4.25	4.60	4.25	4.25	5.00	4.75	5.75
Dec...	7.00	7.00	3.81	7.88	4.81	4.65	5.20	4.50	3.75	3.75	3.50	3.50	3.25	2.69	4.25	4.60	4.15	4.40	5.00	4.75	5.75
Aver...	5.47	18.87	4.63	8.00	6.27	4.48	4.61	4.96	4.11	3.75	3.75	3.50	3.48	3.08	3.08	4.51	4.50	4.20	4.92	4.86	5.60

Monthly Average Steel Prices Computed From Weekly

Composite Price of

AVERAGE of THE IRON AGE quotations on steel bars, shapes, plates, plain wire, open hearth rails, black pipe and black sheets for period prior to 1920; hot-rolled strip

added for subsequent period. A new method of pricing flat-rolled products made effective May 18, 1938, necessitated substituting the price of No. 10 hot-rolled sheets for the

	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920
Jan.....	1.921	1.740	1.713	1.747	1.887	1.923	1.820	1.741	1.615	1.424	1.771	1.451	1.383	2.060	3.384	3.549	3.371	3.534
Feb.....	1.875	1.751	1.725	1.749	1.899	1.920	1.772	1.736	1.620	1.400	1.766	1.477	1.395	2.203	3.501	3.549	3.371	3.534
March.....	1.886	1.769	1.783	1.746	1.905	1.920	1.599	1.727	1.623	1.394	1.786	1.473	1.413	2.447	3.739	3.549	3.282	3.802
April.....	1.886	1.764	1.793	1.741	1.931	1.920	1.577	1.727	1.627	1.433	1.790	1.446	1.437	2.611	4.110	3.549	3.031	3.956
May.....	1.886	1.757	1.799	1.741	1.933	1.920	1.506	1.720	1.620	1.456	1.727	1.424	1.433	2.750	4.562	3.549	3.021	3.890
June.....	1.886	1.737	1.779	1.763	1.927	1.851	1.506	1.707	1.556	1.470	1.687	1.399	1.444	2.689	5.004	3.549	3.021	3.849
July.....	1.884	1.702	1.779	1.763	1.927	1.820	1.543	1.657	1.546	1.504	1.667	1.400	1.471	2.640	5.334	3.549	3.021	3.915
Aug.....	1.879	1.674	1.783	1.763	1.927	1.820	1.581	1.636	1.539	1.553	1.624	1.446	1.511	2.682	5.249	3.549	3.021	3.997
Sept.....	1.871	1.621	1.786	1.763	1.934	1.820	1.616	1.627	1.513	1.610	1.591	1.470	1.559	2.765	5.049	3.549	3.004	3.954
Oct.....	1.867	1.620	1.720	1.780	1.934	1.820	1.664	1.613	1.441	1.659	1.559	1.446	1.634	2.856	3.470	3.549	3.062	3.761
Nov.....	1.812	1.652	1.723	1.820	1.934	1.820	1.674	1.613	1.407	1.700	1.505	1.397	1.769	3.021	3.444	3.549	3.064	3.569
Dec.....	1.761	1.691	1.727	1.870	1.934	1.820	1.727	1.611	1.399	1.725	1.463	1.366	1.941	3.278	3.441	3.461	3.110	3.081
Aver.....	1.808	1.707	1.760	1.770	1.923	1.865	1.632	1.676	1.542	1.527	1.661	1.455	1.553	2.667	4.191	3.548	3.116	3.737

Open-Hearth Steel Billets at Pittsburgh, Gross Ton

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan....	\$28.00	\$37.50	\$40.00	\$38.00	\$35.00	\$35.00	\$33.00	\$33.00	\$34.00	\$30.00	\$27.75	\$26.00	\$26.00	\$27.00	\$29.00	\$34.00	\$37.00	\$34.00
Feb....	28.00	39.63	40.00	38.00	35.00	33.00	33.00	33.25	33.00	30.00	27.00	26.00	26.00	27.00	29.00	34.00	37.00	34.00
March..	28.00	44.39	40.00	36.70	35.00	34.00	33.00	34.00	33.00	30.00	27.00	26.00	26.00	27.00	28.20	36.40	37.00	34.00
April..	29.50	45.00	40.00	35.50	35.00	33.25	33.00	34.80	33.00	30.00	27.00	26.00	26.75	27.00	28.00	37.00	37.00	34.00
May....	34.00	45.00	38.50	35.25	35.00	33.00	33.00	36.00	32.50	29.50	27.00	26.00	26.00	27.00	28.00	37.00	37.00	34.00
June....	35.00	42.63	38.00	35.00	35.00	33.00	32.25	35.25	31.00	29.00	26.50	26.00	26.00	27.00	28.00	37.00	36.40	34.00
July....	35.00	42.50	38.00	35.00	35.00	33.00	32.00	35.00	31.00	29.00	26.00	26.00	27.40	27.00	30.00	37.00	34.00	34.00
Aug....	35.50	42.50	37.75	35.00	35.00	33.00	32.00	35.00	31.00	29.00	26.00	26.00	27.00	27.00	30.00	37.00	34.00	34.00
Sept....	39.50	41.88	36.40	35.00	35.00	33.00	32.00	35.00	31.00	29.00	26.00	26.00	27.00	27.00	30.00	37.00	34.00	34.00
Oct....	40.00	40.00	35.75	34.25	35.00	33.00	32.80	35.00	31.00	29.00	26.00	26.00	27.00	27.00	32.00	37.00	34.00	34.00
Nov....	37.75	40.00	35.50	34.75	35.00	33.00	33.00	35.00	31.00	29.00	26.00	26.00	27.00	28.00	32.00	37.00	34.00	34.00
Dec....	36.50	44.00	36.00	35.00	35.00	33.00	33.00	34.60	30.60	28.80	26.00	26.00	27.00	29.00	32.00	37.00	34.00	34.00
Aver....	\$3.90	\$1.75	\$7.99	\$5.68	\$5.00	\$3.27	\$2.67	\$4.06	\$1.84	\$2.96	\$6.51	\$6.00	\$7.10	\$7.85	\$9.08	\$8.45	\$5.45	\$4.00

Wire Rods at Pittsburgh, Gross Ton

Quotations apply to both open-hearth and bessemer rods

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan....	\$36.00	\$47.00	\$51.00	\$48.00	\$45.00	\$45.00	\$41.60	\$42.00	\$40.00	\$35.00	\$37.00	\$35.80	\$36.00	\$38.00	\$40.00	\$43.00	\$47.00	\$43.00
Feb....	35.75	49.38	51.00	48.00	45.00	43.00	43.00	42.00	39.75	35.00	37.00	35.00	36.00	38.00	40.00	43.00	47.00	43.00
March..	36.00	50.00	51.00	48.00	45.00	43.00	44.00	42.00	38.00	35.00	37.00	35.00	36.00	38.00	38.40	46.20	47.00	43.00
April..	38.00	50.25	51.00	47.00	45.00	42.25	44.00	42.00	38.00	35.00	37.00	35.00	36.50	38.00	38.00	47.00	47.00	43.00
May....	38.00	51.00	48.75	47.00	45.00	42.00	44.00	42.00	36.00	35.00	37.00	35.00	36.00	38.00	38.00	47.00	47.00	43.00
June....	38.50	51.00	48.00	45.60	45.00	42.00	42.00	42.00	36.00	35.00	37.00	35.00	38.00	38.00	38.00	47.00	46.20	43.00
July....	40.00	51.00	48.00	45.00	45.00	42.25	42.00	42.00	36.00	35.00	37.00	35.00	38.00	38.00	38.00	47.00	43.00	43.00
Aug....	42.40	51.00	46.50	45.00	45.00	43.00	42.00	42.00	36.00	35.00	37.00	35.00	38.00	38.00	38.00	47.00	43.00	43.00
Sept....	46.25	51.00	46.00	45.00	45.00	43.00	42.00	42.00	36.00	35.00	37.00	35.00	38.00	38.00	38.00	47.00	43.00	43.00
Oct....	45.00	51.00	45.50	45.00	45.00	42.75	42.00	40.00	36.00	35.00	37.00	35.00	38.00	38.00	40.00	47.00	43.00	43.00
Nov....	45.00	51.00	45.00	45.00	45.00	41.00	42.00	40.00	36.00	35.00	37.00	35.00	38.00	38.50	40.00	47.00	43.00	43.00
Dec....	45.00	51.00	48.00	45.00	45.00	40.00	42.00	40.00	35.20	35.40	37.00	36.00	38.00	40.00	43.00	47.00	43.00	43.00
Aver....	\$0.49	\$0.89	\$8.31	\$6.05	\$5.00	\$4.44	\$2.55	\$1.60	\$6.91	\$5.03	\$7.00	\$5.15	\$7.37	\$8.21	\$9.19	\$6.87	\$4.98	\$3.00

Steel Rails at Mill, Open-Hearth, Gross Ton

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan....	\$40.00	\$43.00	\$43.00	\$43.00	\$43.00	\$43.00	\$43.00	\$43.00	\$43.00	\$43.00	\$43.00	\$40.00	\$36.37	\$36.37	\$36.37	\$39.00	\$42.50	\$40.00
Feb....	40.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	40.00	36.37	36.37	36.37	39.00	42.50	40.00
March..	40.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	40.00	36.37	36.37	36.37	41.80	42.50	40.00
April..	40.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	40.00	36.37	36.37	36.37	42.50	42.50	40.00
May....	40.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	40.00	36.37	36.37	36.37	42.50	42.50	40.00
June....	40.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	40.00	36.37	36.37	36.37	42.50	42.50	40.00
July....	40.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	40.00	36.37	36.37	36.37	42.50	42.50	40.00
Aug....	40.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	40.00	36.37	36.37	36.37	42.50	42.50	40.00
Sept....	40.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	40.00	36.37	36.37	36.37	42.50	41.25	40.00
Oct....	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	42.25	39.55	36.37	36.37	36.37	42.50	40.00	40.00
Nov....	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	40.00	36.38	36.37	36.37	36.37	42.50	40.00	40.00
Dec....	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	40.00	36.38	36.37	36.37	39.00	42.50	40.00	40.00
Aver....	\$0.75	\$5.00	\$8.00	\$5.00	\$5.00	\$5.00	\$5.00	\$5.00	\$5.00	\$5.00	\$4.44	\$9.86	\$6.37	\$6.37	\$9.59	\$1.88	\$1.77	\$0.00

Structural Shapes at Pittsburgh, Cents a Pound

	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan....	2.80	2.47	2.45	1.50	2.06	2.50	2.10	1.90	1.98	1.81	1.90	1.83	1.64	1.50	1.60	1.70	1.80	1.80	2.05	2.25	2.10
Feb....	2.80	2.70	2.26	1.39	2.20	2.50	2.10	1.90	1.90	1.85	1.90	1.80	1.65	1.50	1.60	1.70	1.80	1.80	2.05	2.25	2.10
March..	2.71	3.13	2.08	1.39	2.39	2.39	2.10	1.90	1.90	1.85	1.90	1.80	1.65	1.52	1.60	1.70	1.80	1.80	2.21	2.25	2.10
April..	2.45	3.25	2.10	1.50	2.50	2.29	2.05	1.90	1.88	1.85	1.95	1.80	1.65	1.60	1.60	1.74	1.80	1.80	2.25	2.25	2.10
May....	2.45	3.10	2.20	1.56	2.50	2.29	2.00	1.90	1.80	1.85	1.95	1.73	1.65	1.60	1.60	1.85	1.80	1.80	2.25	2.25	2.10
June...	2.45	3.10	2.10	1.63	2.50	2.20	2.00	1.94	1.80	1.85	1.95	1.69	1.65	1.60	1.60	1.85	1.80	1.80	2.25	2.22	2.10
July...	2.45	3.10	1.93	1.70	2.50	2.09	2.00	2.00	1.80	1.85	1.95	1.65	1.63	1.60	1.60	1.81	1.80	1.90	2.25	2.10	2.10
Aug....	2.45	3.10	1.82	1.88	2.50	2.00	1.95	2.00	1.80	1.90	1.95	1.61	1.60	1.60	1.60	1.80	1.80	1.90	2.25	2.10	2.10
Sept...	2.45	3.10	1.64	2.00	2.50	2.00	1.90	2.00	1.78	1.90	1.95	1.60	1.60	1.60	1.60	1.80	1.80	1.90	2.25	2.10	2.10
Oct....	2.45	3.05	1.60	2.00	2.50	1.93	1.90	2.00	1.75	1.90	1.90	1.60	1.60	1.60	1.70	1.80	1.80	1.90	2.25	2.10	2.10
Nov...	2.45	2.89	1.54	2.00	2.50	2.00	1.90	2.00	1.77	1.90	1.90	1.60	1.60	1.60	1.70	1.80	1.80	1.90	2.25	2.10	2.10
Dec...	2.45	2.45	1.50	2.00	2.50	2.10	1.90	2.00	1.80	1.90	1.90	1.60	1.50	1.60	1.70	1.80	1.80	1.90	2.25	2.10	2.10
Aver.	2.52	2.95	1.94	1.71	2.43	2.19	1.99	1.96	1.83	1.87	1.92	1.69	1.62	1.57	1.63	1.73	1.80	1.85	2.21	2.17	2.10

Market Quotations Published In THE IRON AGE

Finished Steel, Cents a Pound

price of No. 24 gage hot-rolled annealed sheets which was previously used in computing the composite price. The composite price published herewith has been computed back to

1920 on this new basis; previous data are based on No. 24 gage hot-rolled annealed sheets.

	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan...	2.988	1.959	2.400	2.746	2.409	2.323	2.281	2.136	2.192	2.162	1.976	1.879	1.885	1.945	2.056	2.062	2.249	2.512	2.286
Feb...	2.850	1.902	2.534	2.721	2.421	2.315	2.221	2.170	2.192	2.148	1.981	1.877	1.873	1.945	2.056	2.040	2.249	2.512	2.286
March...	2.684	1.902	2.673	2.662	2.424	2.322	2.234	2.178	2.192	2.147	1.981	1.879	1.867	1.945	2.056	2.021	2.459	2.512	2.286
April...	2.638	1.969	2.776	2.592	2.362	2.318	2.226	2.177	2.223	2.097	1.974	1.908	1.817	1.988	2.056	2.028	2.512	2.512	2.286
May...	2.650	2.030	2.772	2.552	2.328	2.304	2.216	2.154	2.226	2.055	1.974	1.908	1.802	2.118	2.056	2.028	2.512	2.506	2.256
June...	2.524	2.086	2.746	2.501	2.305	2.308	2.211	2.154	2.236	2.041	1.964	1.908	1.820	2.118	2.056	2.033	2.512	2.459	2.236
July...	2.366	2.118	2.746	2.450	2.303	2.315	2.209	2.144	2.228	2.018	1.955	1.914	1.878	2.056	2.056	2.091	2.512	2.300	2.236
Aug...	2.222	2.014	2.746	2.395	2.284	2.315	2.209	2.161	2.214	1.998	1.945	1.914	1.883	2.056	2.056	2.091	2.512	2.300	2.236
Sept...	2.153	2.352	2.746	2.356	2.261	2.315	2.200	2.161	2.208	1.988	1.945	1.915	1.890	2.056	2.056	2.096	2.512	2.293	2.236
Oct...	2.113	2.398	2.746	2.337	2.276	2.315	2.152	2.170	2.197	1.981	1.944	1.911	1.950	2.056	2.062	2.116	2.512	2.255	2.236
Nov...	2.055	2.392	2.746	2.353	2.311	2.315	2.131	2.181	2.192	1.978	1.939	1.898	1.933	2.056	2.062	2.116	2.512	2.286	2.242
Dec...	2.001	2.371	2.731	2.399	2.328	2.315	2.133	2.187	2.204	1.964	1.910	1.898	1.945	2.056	2.062	2.199	2.512	2.286	2.261
Aver	2.437	2.124	2.697	2.605	2.334	2.315	2.202	2.165	2.209	2.048	1.957	1.901	1.879	2.033	2.058	2.077	2.464	2.394	2.257

Plates at Pittsburgh, Cents a Pound

	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan...	3.00	2.72	2.65	1.48	2.06	2.50	2.00	1.86	1.90	1.81	1.90	1.83	1.64	1.50	1.60	1.70	1.80	1.80	2.05	2.25	2.10
Feb...	3.00	3.50	2.33	1.39	2.23	2.45	2.00	1.80	1.86	1.85	1.90	1.80	1.65	1.50	1.60	1.70	1.80	1.80	2.05	2.25	2.10
March...	2.91	3.63	2.64	1.39	2.29	2.39	2.00	1.86	1.85	1.85	1.90	1.80	1.65	1.52	1.60	1.70	1.80	1.80	2.21	2.25	2.10
April...	2.65	3.75	2.10	1.48	2.50	2.28	2.00	1.90	1.85	1.85	1.95	1.80	1.65	1.60	1.55	1.74	1.80	1.80	2.25	2.25	2.10
May...	2.65	3.75	2.20	1.56	2.50	2.20	2.00	1.86	1.84	1.85	1.95	1.73	1.65	1.60	1.50	1.85	1.80	1.80	2.25	2.25	2.10
June...	2.65	3.55	1.95	1.63	2.50	2.18	1.92	1.88	1.80	1.85	1.95	1.69	1.65	1.60	1.53	1.85	1.80	1.80	2.25	2.22	2.10
July...	2.65	3.38	1.85	1.70	2.50	2.09	1.90	1.90	1.80	1.85	1.95	1.65	1.63	1.60	1.60	1.81	1.80	1.80	2.25	2.10	2.10
Aug...	2.65	3.25	1.78	1.88	2.50	1.95	1.85	1.90	1.80	1.90	1.95	1.61	1.60	1.60	1.60	1.80	1.80	1.80	2.25	2.10	2.10
Sept...	2.63	3.25	1.64	2.13	2.50	1.82	1.80	1.90	1.78	1.90	1.95	1.60	1.60	1.60	1.60	1.80	1.80	1.80	2.25	2.10	2.10
Oct...	2.61	3.09	1.60	2.11	2.50	1.80	1.80	1.90	1.75	1.90	1.94	1.60	1.60	1.60	1.70	1.80	1.80	1.80	2.25	2.10	2.10
Nov...	2.65	2.81	1.54	1.99	2.50	1.83	1.85	1.90	1.77	1.90	1.90	1.60	1.60	1.60	1.70	1.80	1.80	1.80	2.25	2.10	2.10
Dec...	2.65	2.65	1.50	1.95	2.50	1.92	1.90	1.90	1.80	1.90	1.90	1.60	1.54	1.60	1.70	1.80	1.80	1.80	2.25	2.10	2.10
Aver	2.72	3.28	1.93	1.72	2.43	2.12	1.91	1.88	1.82	1.87	1.93	1.69	1.62	1.57	1.61	1.78	1.80	1.85	2.21	2.17	2.10

Soft Steel Bars at Pittsburgh, Cents a Pound

	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan...	2.70	2.75	2.35	1.50	2.04	2.40	2.10	2.00	1.98	1.81	1.90	1.89	1.64	1.50	1.60	1.75	1.80	1.85	2.20	2.45	2.25
Feb...	2.70	3.00	2.15	1.39	2.20	2.40	2.10	2.00	1.90	1.85	1.90	1.85	1.65	1.50	1.60	1.75	1.80	1.85	2.20	2.45	2.25
March...	2.61	3.63	2.00	1.39	2.29	2.40	2.10	2.00	1.90	1.85	1.90	1.85	1.65	1.52	1.60	1.75	1.80	1.85	2.40	2.45	2.25
April...	2.35	3.75	2.05	1.50	2.50	2.29	2.05	2.00	1.89	1.85	1.95	1.79	1.65	1.60	1.60	1.79	1.80	1.85	2.45	2.45	2.25
May...	2.35	3.63	2.10	1.58	2.40	2.24	2.00	1.95	1.85	1.85	1.95	1.75	1.65	1.60	1.60	1.90	1.80	1.85	2.45	2.45	2.19
June...	2.35	3.50	2.05	1.70	2.40	2.20	2.00	2.00	1.81	1.85	1.95	1.73	1.65	1.60	1.60	1.90	1.80	1.85	2.45	2.41	2.15
July...	2.35	3.50	1.84	1.70	2.40	2.15	2.00	2.00	1.80	1.85	1.95	1.65	1.63	1.60	1.60	1.82	1.80	1.95	2.45	2.25	2.15
Aug...	2.35	3.25	1.74	1.88	2.40	2.13	1.95	2.00	1.80	1.90	1.95	1.64	1.60	1.60	1.60	1.80	1.80	1.95	2.45	2.25	2.15
Sept...	2.35	3.25	1.63	2.00	2.40	2.04	1.92	2.00	1.78	1.90	1.94	1.61	1.60	1.60	1.60	1.80	1.80	1.97	2.45	2.25	2.15
Oct...	2.39	3.13	1.55	2.00	2.40	2.00	2.00	2.00	1.75	1.91	1.90	1.60	1.60	1.60	1.75	1.80	1.85	2.05	2.45	2.25	2.15
Nov...	2.69	2.87	1.50	2.00	2.40	2.03	2.00	2.00	1.77	1.94	1.90	1.60	1.60	1.60	1.75	1.80	1.85	2.05	2.45	2.25	2.15
Dec...	2.75	2.35	1.50	2.00	2.40	2.10	2.00	2.00	1.80	1.90	1.90	1.60	1.58	1.60	1.75	1.80	1.85	2.05	2.45	2.25	2.15
Aver	2.50	3.22	1.87	1.72	2.36	2.20	2.02	2.00	1.84	1.87	1.92	1.71	1.63	1.57	1.64	1.81	1.81	1.93	2.40	2.33	2.19

No. 24 Gage Galvanized Sheets, at Pittsburgh, Cents a Pound

	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan...	6.05	5.33	5.70	4.00	4.35	4.98	4.75	4.60	3.78	3.65	3.60	3.33	2.90	2.80	2.68	2.85	3.10	3.10	3.40	3.80	3.50
Feb...	6.05	6.50	5.56	4.00	4.54	5.00	4.75	4.53	3.71	3.65	3.60	3.30	2.90	2.75	2.50	2.85	3.10	3.10	3.40	3.80	3.50
March...	5.96	7.00	5.05	4.00	4.93	4.93	4.62	4.50	3.65	3.65	3.60	3.30	2.90	2.85	2.60	2.85	3.10	3.10	3.72	3.80	3.50
April...	5.70	7.00	4.88	4.11	5.25	4.88	4.45	4.50	3.63	3.65	3.60	3.30	2.84	2.85	2.63	2.95	3.10	3.10	3.80	3.80	3.50
May...	5.70	7.00	5.00	4.15	5.20	4.80	4.29	4.43	3.72	3.59	3.60	3.23	2.80	2.85	2.70	3.25	3.10	3.10	3.80	3.80	3.46
June...	5.70	7.00	4.88	4.15	5.00	4.76	4.21	4.28	3.85	3.50	3.60	3.19	2.74	2.85	2.70	3.25	3.10	3.10	3.80	3.68	3.50
July...	5.70	8.25	4.31	4.15	5.00	4.56	4.19	4.24	3.85	3.46	3.60	3.13	2.90	2.85	2.85	3.13	3.10	3.20	3.80	3.50	3.50
Aug...	5.70	9.00	3.90	4.23	5.00	5.55	4.20	4.23	3.85	3.40	3.50	3.05	2.90	2.81	2.85	3.10	3.10	3.20	3.80	3.50	3.50
Sept...	5.70	8.88	3.81	4.35	5.00	4.60	4.20	4.20	3.83	3.85	3.40	3.50	3.00	2.90	2.75	2.85	3.10	3.10	3.20	3.80	3.50
Oct...	5.70	8.18	4.00	4.50	5.00	4.60	4.23	3.85	3.76	3.50	3.50	2.99	2.90	2.85	2.85	3.10	3.10	3.20	3.80	3.45	3.50
Nov...	5.70	7.04	3.86	4.43	4.93	4.60	4.50	3.85	3.66	3.50	3.48	2.95	2.90	2.85	2.85	3.10	3.10	3.20	3.80	3.50	3.50
Dec...	5.70	5.70	4.00	4.35	4.89	4.72	4.60	3.85	3.63	3.58	3.40	2.92	2.86	2.85	2.85	3.10	3.10	3.40	3.80	3.50	3.50
Aver	5.78	7.24	4.58	4.20	4.92	4.75	4.42	3.89	3.75	3.64	3.55	3.14	2.87	2.83	2.74	3.05	3.10	3.17	3.73	3.64	3.50

*No. 24 gage was made the base in September, 1926. Quotations prior to that time are for No. 28 gage, for which there is now an extra of 50c. per 100 lb.

Cold-Finished Steel Bars at Pittsburgh, Cents a Pound

	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	2.15	2.08	2.00	1.70	2.10	2.10	2.10	2.55	2.90	2.70
Feb.....	2.10	2.10	2.00	1.70	2.10	2.10	2.10	2.55	2.90	2.70
March.....	2.10	2.10	2.00	1.70	2.10	2.10	2.10	2.83	2.90	2.70
April.....	2.10	2.10	2.00	1.70	2.10	2.01	2.10	2.90	2.90	2.70
May.....	2.10	2.10	1.82	1.70	2.10	1.95	2.10	2.90	2.90	2.65
June.....	2.10	2.10	1.70	1.70	2.10	1.95	2.10	2.90	2.70	2.65
July.....	2.10	2.10	1.70	1.70	2.10	1.95	2.25	2.90	2.70	2.65
Aug.....	2.10	2.10	1.70	1.70	2.10	1.95	2.25	2.90	2.70	2.65
Sept.....	2.10	2.10	1.70	1.95	2.10	1.95	2.25	2.90	2.70	2.65
Oct.....	2.10	2.10	1.70	1.95	2.10	1.95	2.35	2.90	2.70	2.65
Nov.....	2.00	2.10	1.70	1.95	2.10	1.95	2.35	2.90	2.70	2.65
Dec.....	2.00	2.02	1.70	2.10	2.10	1.95	2.35	2.90	2.70	2.65
Aver.....	2.09	2.09	1.81	1.80	2.10	1.99	2.20	2.84	2.78	2.67

Hot-Rolled Strip at Pittsburgh, Cents a Pound (Prices quoted only on strip wider than 6-in. prior to June 1, 1932.)

	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	3.30	2.00	2.75	3.00	2.25	2.30	2.34	2.01	1.80	1.80	1.55	1.41	1.45	1.75	1.85	1.85	2.15	2.40	2.15
Feb.....	3.11	1.84	2.86	3.00	2.35	2.30	2.21	2.08	1.80	1.80	1.55	1.40	1.45	1.75	1.85	1.85	2.15	2.40	2.15
March.....	2.93	1.81	3.18	2.93	2.40	2.30	2.30	2.10	1.80	1.79	1.55	1.40	1.45	1.75	1.85	1.85	2.35	2.40	2.15
April.....	2.76	1.98	3.30	2.75	2.40	2.30	2.30	2.10	1.90	1.70	1.55	1.40	1.45	1.81	1.85	1.85	2.40	2.40	2.15
May.....	2.53	2.20	2.30	2.75	2.20	2.30	2.30	1.96	1.90	1.70	1.55	1.40	1.49	2.00	1.85	1.85	2.40	2.38	2.06
June.....	2.50	2.40	3.23	2.50	2.20	2.30	2.30	1.85	1.90	1.69	1.55	1.41	1.55	2.00	1.85	1.85	2.40	2.27	2.00
July.....	2.46	2.50	3.00	2.50	2.20	2.30	2.30	1.85	1.90	1.65	1.55	1.45	1.60	1.88	1.85	1.95	2.40	2.15	2.00
Aug.....	2.23	2.60	3.00	2.35	2.20	2.30	2.30	1.85	1.90	1.65	1.55	1.45	1.64	1.85	1.85	1.95	2.40	2.15	2.00
Sept.....	2.00	2.75	3.00	2.25	2.20	2.30	2.30	1.85	1.90	1.65	1.55	1.45	1.68	1.85	1.85	1.95	2.40	2.15	2.00
Oct.....	2.00	2.90	3.00	2.25	2.23	2.30	2.19	1.85	1.90	1.60	1.54	1.45	1.75	1.85	1.85	1.95	2.40	2.03	2.00
Nov.....	2.00	2.83	3.00	2.25	2.30	2.30	2.10	1.88	1.90	1.58	1.50	1.45	1.75	1.85	1.85	1.95	2.40	2.15	2.02
Dec.....	2.00	2.75	2.88	2.25	2.30	2.30	2.03	1.80	1.90	1.55	1.49	1.45	1.75	1.85	1.85	2.11	2.40	2.15	2.10
Aver.....	\$2.49	\$2.38	\$3.04	\$2.67	\$2.27	\$2.30	\$2.26	\$1.95	\$1.88	\$1.68	\$1.54	\$1.45	\$1.68	\$1.85	\$1.85	\$1.91	\$2.35	\$2.25	\$2.06

From May 10 to and including May 15, 1939, reductions of from \$4 to \$8 a ton off base prices were prevalent. Although these concessions were withdrawn on May 15, many orders originally placed at concessions ranging from \$4 to \$6 were later adjusted to the maximum \$8 reduction from the base price.

Cold-Rolled Strip at Pittsburgh, Cents a Pound

	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	6.25	3.50	4.50	5.00	4.00	3.90	2.95	3.00	2.85	2.65	2.25	1.92	1.88	2.40	2.60	2.60	2.85	3.20	2.95
Feb.....	6.06	3.50	4.69	4.75	4.00	3.90	2.80	3.00	2.85	2.65	2.25	1.90	1.80	2.40	2.60	2.60	2.85	3.20	2.95
March.....	5.82	3.50	5.00	4.75	4.00	3.90	2.92	3.00	2.80	2.60	2.25	1.96	1.80	2.40	2.60	2.60	3.13	3.20	2.95
April.....	5.64	3.61	5.25	4.75	4.00	3.79	3.00	3.00	2.75	2.55	2.23	2.00	1.80	2.50	2.60	2.60	3.20	3.20	2.95
May.....	4.98	3.71	5.25	4.50	3.94	3.75	3.00	3.00	2.75	2.50	2.15	2.00	1.88	2.80	2.60	2.60	3.20	3.18	2.86
June.....	4.88	4.00	5.19	4.50	3.63	3.72	3.19	3.00	2.75	2.45	2.15	2.00	1.80	2.80	2.60	2.60	3.20	3.07	2.80
July.....	4.25	4.00	5.00	4.30	3.63	3.60	3.25	2.92	2.75	2.45	2.15	2.00	2.19	2.64	2.60	2.60	3.20	2.95	2.80
Aug.....	3.96	4.10	5.00	4.13	3.75	3.60	3.25	2.90	2.75	2.35	2.15	2.00	2.25	2.60	2.60	2.60	3.20	2.95	2.80
Sept.....	3.78	4.25	5.00	4.00	3.75	3.50	3.25	2.72	2.75	2.35	2.15	1.92	2.29	2.60	2.60	2.60	3.20	2.95	2.80
Oct.....	3.75	4.50	5.00	4.00	3.75	3.25	3.00	2.75	2.75	2.35	2.13	1.90	2.40	2.60	2.60	2.60	3.20	2.83	2.80
Nov.....	3.75	4.50	4.98	4.00	3.90	3.25	3.00	2.85	2.75	2.33	2.05	2.00	2.40	2.60	2.60	2.60	3.20	2.95	2.80
Dec.....	3.75	4.50	4.91	4.00	3.90	3.00	3.00	2.85	2.75	2.25	2.03	2.00	2.40	2.60	2.60	2.60	3.20	2.95	2.80
Aver.....	4.73	3.97	4.98	4.59	3.85	3.60	3.05	2.92	2.77	2.46	2.16	1.97	2.09	2.68	2.60	2.62	3.14	3.05	2.86

From May 10 to and including May 15, 1939, reductions from the base price amounting to \$4 a ton were prevalent. Concessions were withdrawn May 15.

Hot-Rolled Sheets at Pittsburgh, Cents a Pound

	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	2.52	3.00	2.70	2.50	2.25	2.10	2.10	2.10	1.90	1.75	1.62	1.75	1.85	1.85	2.15	2.40	2.15
Feb.....	2.64	3.00	2.70	2.50	2.20	2.10	2.10	2.10	1.90	1.75	1.60	1.75	1.85	1.85	2.15	2.40	2.15
March.....	2.95	2.93	2.69	2.50	2.20	2.10	2.10	2.10	1.90	1.71	1.85	1.75	1.85	1.85	2.35	2.40	2.15
April.....	3.25	2.86	2.63	2.43	2.18	2.08	2.10	2.06	1.85	1.70	1.55	1.81	1.85	1.85	2.40	2.40	2.15
May.....	3.20	2.80	2.40	2.40	2.22	2.00	2.13	2.00	1.85	1.70	1.44	2.00	1.85	1.85	2.40	2.38	2.06
June.....	3.00	2.76	2.31	2.32	2.25	2.00	2.20	2.00	1.85	1.70	1.50	2.00	1.85	1.87	2.40	2.27	2.00
July.....	3.00	2.68	2.30	2.30	2.25	2.00	2.14	2.00	1.85	1.70	1.65	1.88	1.85	1.95	2.40	2.15	2.00
Aug.....	3.00	2.63	2.30	2.30	2.25	2.00	2.10	1.93	1.85	1.70	1.65	1.85	1.85	1.95	2.40	2.15	2.00
Sept.....	3.00	2.69	2.25	2.30	2.25	2.00	2.10	1.90	1.85	1.70	1.68	1.85	1.85	1.95	2.40	2.15	2.00
Oct.....	3.00	2.70	2.26	2.30	2.14	2.00	2.10	1.90	1.85	1.70	1.75	1.85	1.85	1.95	2.40	2.03	2.00
Nov.....	3.00	2.70	2.40	2.30	2.10	2.00	2.10	1.90	1.85	1.70	1.75	1.85	1.85	1.95	2.40	2.15	2.02
Dec.....	3.00	2.70	2.50	2.30	2.10	2.08	2.18	1.90	1.80	1.70	1.75	1.85	1.85	2.15	2.40	2.15	2.10
Aver.....	2.96	2.79	2.45	2.37	2.20	2.04	2.12	1.99	1.86	1.71	1.62	1.85	1.85	1.92	2.35	2.25	2.06

From May 10 to and including May 15, 1939, reductions of from \$4 to \$8 a ton under the base price were prevalent. These concessions were withdrawn on May 15. Subsequent to May 15, many orders originally placed at \$4 to \$6 below the base price were adjusted to the full \$8 concession.

Cold-Rolled Sheets at Pittsburgh, Cents a Pound

	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	4.70	5.35	4.75	4.50	4.18	4.00	4.10	3.90	3.30	2.90	2.35	2.75	2.95	2.95	3.25	3.55	3.20
Feb.....	4.78	5.35	4.68	4.43	4.15	4.08	4.10	3.90	3.30	2.80	2.25	2.75	2.95	2.95	3.25	3.50	3.20
March.....	5.00	5.35	4.46	4.40	4.15	4.15	4.10	3.88	3.24	2.86	2.30	2.75	2.95	2.95	3.49	3.45	3.20
April.....	5.00	5.25	4.40	4.33	4.15	4.04	4.10	3.80	3.10	2.90	2.30	2.85	2.95	2.95	3.55	3.45	3.20
May.....	5.35	5.10	4.40	4.29	4.15	4.00	4.10	3.75	3.03	2.89	2.34	3.15	2.95	2.95	3.55	3.43	3.11
June.....	5.35	5.10	4.22	4.20	4.25	4.00	4.10	3.65	3.02	2.85	2.29	3.15	2.95	2.95	3.55	3.32	3.05
July.....	5.35	5.06	4.15	4.20	4.25	4.00	4.10	3.60	3.10	2.85	2.40	2.99	2.95	3.05	3.55	3.20	3.05
Aug.....	5.35	4.75	4.25	4.20	4.25	4.00	4.08	3.60	3.10	2.81	2.47	2.95	2.95	3.05	3.55	3.20	3.05
Sept.....	5.35	4.72	4.25	4.25	4.25	4.00	4.00	3.50	3.10	2.75	2.75	2.95	2.95	3.05	3.55	3.20	3.05
Oct.....	5.35	4.60	4.29	4.25	4.15	4.00	4.00	3.45	3.10	2.65	2.75	2.95	2.95	3.05	3.55	3.08	3.05
Nov.....	5.35	4.60	4.40	4.25	4.12	4.00	4.00	3.38	3.10	2.63	2.75	2.95	2.95	3.05	3.55	3.20	3.05
Dec.....	5.25	4.75	4.50	4.25	4.00	4.08	3.98	3.30	3.02	2.65	2.75	2.95	2.95	3.25	3.55	3.20	3.05
Aver.....	5.19	5.00	4.39	4.30	4.17	4.03	4.06	3.64	3.15	2.80	2.48	2.96	2.95	3.02	3.49	3.31	3.10

*No. 22 gage prior to Sept. 1, 1926. No. 20 gage from then until May 18, 1938. Subsequently cold rolled sheet base adopted May 18. From May 10 to and including May 15, 1939, reductions of from \$4 to \$8 a ton under the base price were prevalent. These concessions were withdrawn May 15. Subsequent to May 15, many orders originally placed at \$4 to \$6 below the base price were adjusted to the full \$8 concession.

Tin Plate at Pittsburgh, Dollars a Base Box

	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$7.00	\$7.00	\$4.75	\$4.75	\$5.50	\$5.50	\$5.50	\$5.50	\$5.25	\$5.35	\$5.25	\$5.00	\$4.75	\$4.25	\$5.25	\$5.25	\$5.25	\$4.85	\$5.35	\$5.00
Feb.....	7.00	7.00	4.71	4.80	5.50	5.50	5.50	5.50	5.25	5.35	5.25	5.00	4.75	4.25	5.25	5.25	5.25	4.85	\$5.35	5.00
March.....	7.00	7.00	4.60	5.23	5.50	5.50	5.50	5.50	5.25	5.35	5.25	5.00	4.75	4.25	5.25	5.25	5.25	4.85	\$5.35	5.00
April.....	7.00	6.44	4.75	6.00	5.50	5.50	5.50	5.50	5.25	5.35	5.25	5.00	4.75	4.25	5.25	5.25	5.25	5.35	\$5.35	5.00
May.....	7.00	6.25	4.75	5.70	5.50	5.50	5.50	5.50	5.25	5.35	5.25	5.00	4.75	4.25	5.25	5.25	5.25	5.35	\$5.35	5.00
June.....	7.00	6.25	4.75	5.50	5.50	5.50	5.50	5.50	5.25	5.35	5.25	5.00	4.75	4.25	5.25	5.25	5.25	5.35	\$5.35	5.00
July.....	7.50	5.69	4.75	5.50	5.50	5.50	5.50	5.50	5.25	5.35	5.25	5.00	4.75	4.25	5.25	5.25	5.25	5.35	\$5.35	5.00
Aug.....	9.00	5.25	4.75	5.50	5.50	5.50	5.50	5.50	5.25	5.35	5.25	5.00	4.75	4.25	5.25	5.25	5.25	5.35	\$5.35	5.00
Sept.....	9.00	5.25	4.75	5.50	5.50	5.50	5.50	5.50	5.25	5.35	5.25	5.00	4.75	4.65	5.25	5.25	5.25	5.35	\$5.35	5.00
Oct.....	8.33	5.13	4.75	5.50	5.50	5.50	5.50	5.50	5.25	5.35	5.00	4.75	4.75	4.65	5.25	5.25	5.25	5.35	\$5.35	5.00
Nov.....	7.50	4.75	4.75	5.50	5.50	5.50	5.50	5.50	5.25	5.35	5.00	4.75	4.55	4.65	5.25	5.25	5.25	5.35	\$5.18	5.00
Dec.....	7.00	4.73	4.75	5.50	5.50	5.50	5.50	5.25	5.25	5.35	5.00	4.75	4.25	5.25	5.25	5.25	5.25	5.35	5.00	5.00
Aver.....	7.63	6.90	4.73	5.48	5.50	5.50	5.50	5.48	5.26	5.36	5.19	4.94	4.69	4.43	5.26	5.26	5.26	5.28	5.31	5.00

Wire Nails at Pittsburgh, Dollars per Keg of 100 Lb.

	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$4.50	\$3.25	\$2.50	\$2.70	\$3.00	\$2.85	\$2.65	\$2.64	\$2.54	\$2.65	\$2.33	\$1.90	\$1.95	\$1.86	\$2.35	\$2.60	\$2.40	\$2.25	\$2.75	\$2.45
Feb.....	4.50	3.21	2.40	2.78	3.00	2.85	2.65	2.56	2.63	2.65	2.25	1.90	1.95	1.83	2.35	2.60	2.25	2.31	2.75	2.45
March.....	4.00	3.02	2.40	2.83	3.00	2.85	2.65	2.55	2.65	2.65	2.25	1.90	1.95	1.85	2.35	2.60	2.10	2.70	2.75	2.45
April.....	4.00	3.13	2.40	2.93	3.00	2.80	2.65	2.55	2.65	2.65	2.16	1.90	1.95	1.85	2.41	2.60	2.10	2.75	2.75	2.45
May.....	4.00	3.05	2.40	3.00	2.93	2.75	2.65	2.50	2.55	2.65	2.15	1.85	1.95	1.85	2.60	2.60	2.10	2.75	2.75	2.45
June.....	4.00	3.00	2.40	3.00	2.90	2.68	2.65	2.50	2.55	2.65	2.13	1.80	1.95	1.85	2.60	2.60	2.10	2.75	2.69	2.45
July.....	4.00	2.81	2.40	3.00	2.88	2.65	2.65	2.53	2.55	2.64	2.05	1.80	1.95	2.04	2.60	2.60	2.10	2.75	2.45	2.41
Aug.....	4.25	2.75	2.48	3.00	2.81	2.65	2.65	2.55	2.55	2.64	2.04	1.88	1.95	2.10	2.60	2.55	2.10	2.75	2.45	2.40
Sept.....	4.25	2.86	2.63	3.00	2.78	2.65	2.65	2.55	2.55	2.50	2.00	1.90	1.95	2.10	2.60	2.40	1.97	2.75	2.45	2.40
Oct.....	4.25	2.90	2.70	3.00	2.75	2.63	2.65	2.54	2.55	2.43	1.99	1.90	1.95	2.10	2.60	2.40	2.05	2.75	2.45	2.52
Nov.....	4.05	2.84	2.70	3.00	2.75	2.65	2.65	2.50	2.55	2.40	1.93	1.90	1.95	2.10	2.60	2.40	2.05	2.75	2.45	2.55
Dec.....	3.25	2.69	2.70	3.00	2.85	2.65	2.65	2.50	2.53	2.40	1.90	1.93	1.95	2.35	2.60	2.40	2.25	2.75	2.45	2.55
Aver.....	4.09	2.96	2.61	2.94	2.89	2.78	2.65	2.54	2.58	2.57	2.10	1.88	1.95	1.99	2.58	2.53	2.13	2.67	2.60	2.46

Plain Wire, Base, at Pittsburgh, Cents a Pound

	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	3.25	3.25	2.25	2.45	2.75	2.60	2.50	2.49	2.40	2.50	2.40	2.20	2.20	2.16	2.20	2.30	2.30	2.60	2.90	2.60
Feb.....	3.50	3.13	2.20	2.63	2.75	2.60	2.50	2.41	2.48	2.50	2.40	2.20	2.20	2.10	2.20	2.30	2.30	2.60	2.90	2.60
March.....	3.50	3.00	2.25	2.65	2.75	2.60	2.50	2.40	2.50	2.50	2.40	2.20	2.20	2.10	2.20	2.30	2.30	2.84	2.90	2.60
April.....	3.50	3.00	2.25	2.68	2.75	2.50	2.50	2.40	2.50	2.50	2.38	2.20	2.20	2.10	2.23	2.30	2.40	2.90	2.90	2.60
May.....	3.50	3.00	2.25	2.75	2.68	2.50	2.50	2.40	2.50	2.50	2.30	2.20	2.20	2.10	2.30	2.30	2.40	2.90	2.90	2.60
June.....	3.50	2.75	2.25	2.75	2.65	2.49	2.50	2.40	2.50	2.50	2.30	2.20	2.20	2.10	2.30	2.30	2.40	2.90	2.84	2.60
July.....	3.50	2.56	2.25	2.75	2.63	2.50	2.50	2.40	2.42	2.50	2.30	2.20	2.20	2.10	2.30	2.30	2.40	2.90	2.60	2.60
Aug.....	3.69	2.50	2.29	2.75	2.56	2.50	2.50	2.40	2.40	2.43	2.30	2.20	2.20	2.10	2.30	2.30	2.40	2.90	2.60	2.60
Sept.....	3.75	2.58	2.39	2.75	2.63	2.50	2.50	2.40	2.40	2.40	2.30	2.20	2.20	2.10	2.30	2.30	2.40	2.90	2.60	2.60
Oct.....	3.75	2.60	2.45	2.75	2.50	2.50	2.50	2.40	2.40	2.40	2.30	2.20	2.20	2.10	2.30	2.30	2.50	2.90	2.60	2.60
Nov.....	3.65	2.56	2.45	2.75	2.50	2.50	2.50	2.40	2.40	2.40	2.30	2.20	2.20	2.10	2.30	2.30	2.50	2.90	2.60	2.60
Dec.....	3.25	2.44	2.45	2.75	2.60	2.50	2.50	2.40	2.48	2.40	2.22	2.20	2.20	2.20	2.30	2.30	2.60	2.90	2.60	2.60
Aver.....	3.53	2.78	2.31	2.70	2.64	2.53	2.50	2.41	2.45	2.46	2.33	2.20	2.20	2.11	2.27	2.30	2.41	2.84	2.74	2.60

Black Plate at Pittsburgh, Cents a Pound (28 gage up to July 1, 1938; 29 and lighter since)

	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	2.95	2.65	2.54	2.29	2.65	2.75	2.75	2.95	3.30	3.05
Feb.....	2.95	2.63	2.50	2.28	2.65	2.75	2.75	2.95	3.30	3.05
March.....	2.89	2.60	2.45	2.30	2.65	2.75	2.75	3.21	3.30	3.05
April.....	2.85	2.60	2.45	2.30	2.70	2.75	2.75	3.30	3.30	3.05
May.....	2.84	2.60	2.43	2.30	2.85	2.75	2.75	3.30	3.30	3.05
June.....	2.82	2.60	2.40	2.30	2.85	2.75	2.75	3.30	3.30	3.05
July.....	2.78	2.60	2.40	2.93	2.78	2.75	2.75	3.30	3.26	3.05
Aug.....	2.75	2.58	2.39	2.50	2.75	2.75	2.75	3.30	3.15	3.05
Sept.....	2.75	2.65	2.35	2.80	2.75	2.75	2.75	3.30	3.15	3.05
Oct.....	2.75	2.65	2.35	2.50	2.75	2.75	2.75	3.30	3.15	3.05
Nov.....	2.67	2.65	2.30	2.50	2.75	2.75	2.75	3.30	3.15	3.05
Dec.....	2.67	2.65	2.30	2.65	2.75	2.75	2.95	3.30	3.05	3.05
Aver.....	2.81	2.62	2.41	2.45	2.74	2.75	2.76	3.23	3.23	3.05

Soft Steel Bars at Chicago, Cents a Pound

	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	1.99	1.71	1.68	1.70	1.80	1.85	1.90	2.25	2.50	2.50
Feb.....	1.95	1.72	1.65	1.70	1.80	1.85	1.90	2.25	2.50	2.50
March.....	1.95	1.70	1.68	1.70	1.80	1.85	1.90	2.45	2.50	2.50
April.....	1.91	1.75	1.70	1.70	1.84	1.85	1.90	2.50	2.50	2.50
May.....	1.85	1.70	1.70	1.70	1.95	1.85	1.90	2.50	2.50	2.50
June.....	1.83	1.70	1.70	1.70	1.95	1.85	1.90	2.50	2.45	2.15
July.....	1.75	1.70	1.70	1.70	1.87	1.85	2.00	2.50	2.25	2.15
Aug.....	1.75	1.70	1.70	1.69	1.85	1.85	2.00	2.50	2.25	2.15
Sept.....	1.71	1.70	1.70	1.65	1.85	1.85	2.00	2.50	2.25	2.15
Oct.....	1.70	1.70	1.70	1.80	1.85	1.90	2.10	2.50	2.25	2.15
Nov.....	1.70	1.70	1.70	1.80	1.85	1.90	2.10	2.50	2.25	2.15
Dec.....	1.70	1.60	1.70	1.80	1.85	1.90	2.10	2.50	2.25	2.15
Aver.....	1.82	1.70	1.69	1.72	1.86	1.88	1.97	2.45	2.37	2.19

Structural Shapes at Chicago, Cents a Pound

	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	1.99	1.71	1.68	1.70	1.75	1.85	1.85	2.10	2.30	2.10
Feb.....	1.95	1.72	1.65	1.70	1.75	1.85	1.85	2.10	2.30	2.10
March.....	1.94	1.70	1.68	1.70	1.75	1.85	1.85	2.25	2.30	2.10
April.....	1.90	1.75	1.70	1.70	1.75	1.85	1.85	2.30	2.30	2.10
May.....	1.83	1.70	1.70	1.70	1.90	1.85	1.85	2.30	2.30	2.10
June.....	1.79	1.70	1.70	1.70	1.90	1.85	1.85	2.30	2.26	2.10
July.....	1.75	1.70	1.70	1.70	1.86	1.85	1.95	2.30	2.10	2.10
Aug.....	1.75	1.70	1.70	1.69	1.85	1.85	1.95	2.30	2.10	2.10
Sept.....	1.71	1.70	1.70	1.65	1.85	1.85	1.95	2.30	2.10	2.10
Oct.....	1.70	1.70	1.70	1.75	1.85	1.85	1.95	2.30	2.10	2.10
Nov.....	1.70	1.70	1.70	1.75	1.85	1.85	1.95	2.30	2.10	2.10
Dec.....	1.70	1.60	1.70	1.75	1.85	1.85	1.95	2.30	2.10	2.10
Aver.....	1.81	1.70	1.69	1.71	1.83	1.86	1.90	2.26	2.20	2.10

Rail Steel Bars at Chicago, Cents a Pound

	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	1.88	1.60	1.50	1.50	1.70	1.75	1.75	2.10	2.35	2.10
Feb.....	1.80	1.60	1.50	1.50	1.70	1.75	1.75	2.10	2.35	2.10
March.....	1.85	1.60	1.50	1.50	1.70	1.75	1.75	2.30	2.35	2.10
April.....	1.81	1.60	1.50	1.50	1.74	1.75	1.75	2.25	2.35	2.10
May.....	1.80	1.60	1.50	1.50	1.85	1.75	1.75	2.25	2.35	2.10
June.....	1.75	1.60	1.50	1.50	1.86	1.75	1.75	2.35	2.30	2.00
July.....	1.75	1.60	1.50	1.50	1.79	1.75	1.85	2.35	2.10	2.00
Aug.....	1.65	1.60	1.50	1.51	1.75	1.75	1.85	2.35	2.10	2.00
Sept.....	1.65	1.60	1.50	1.55	1.75	1.75	1.85	2.35	2.10	2.02
Oct.....	1.65	1.54	1.50	1.70	1.75	1.75	1.95	2.35	2.10	2.15
Nov.....	1.64	1.50	1.50	1.70	1.75	1.75	1.95	2.35	2.10	2.15
Dec.....	1.60	1.50	1.50	1.70	1.75	1.75	1.95	2.35	2.10	2.15
Aver.....	1.74	1.58	1.50	1.56	1.76	1.75	1.82	2.30	2.22	2.08

Common Bar Iron at Chicago, Cents a Pound

	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	1.98	1.71	1.68	1.60	1.60	1.80	1.80	2.15	2.40	2.15
Feb.....	1.95	1.73	1.70	1.60	1.60	1.80	1.80	2.15	2.40	2.15
March.....	1.95	1.70	1.70	1.60	1.60	1.80	1.80	2.35	2.40	2.15
April.....	1.92	1.74	1.70	1.60	1.60	1.80	1.80	2.40	2.40	2.15
May.....	1.90	1.70	1.66	1.60	1.69	1.80	1.80	2.40	2.40	2.15
June.....	1.90	1.70	1.65	1.60	1.85	1.80	1.80	2.40	2.40	2.15
July.....	1.90	1.70	1.65	1.60	1.84	1.80	1.80	2.40	2.15	2.15
Aug.....	1.75	1.70	1.62	1.60	1.80	1.80	1.80	2.40	2.15	2.15
Sept.....	1.74	1.70	1.60	1.60	1.80	1.80	1.80	2.40	2.15	2.15
Oct.....	1.70	1.70	1.60	1.60	1.80	1.80	1.80	2.40	2.15	2.15
Nov.....	1.70	1.70	1.60	1.60	1.80	1.80	1.80	2.40	2.15	2.15
Dec.....	1.70	1.60	1.60	1.60	1.80	1.80	1.80	2.40	2.15	2.15
Aver.....	1.84	1.70	1.65	1.60	1.76	1.80	1.80	2.35	2.27	2.15

Pipe

Cast Iron Pipe at New York, Net Ton 6-in. and Larger

	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$54.90	\$61.60	\$54.60	\$50.60	\$48.60	\$37.25	\$39.60	\$36.10	\$37.90	\$30.20	\$35.30	\$43.00	\$45.00	\$45.20	\$48.00	\$53.00	\$49.00
Feb.....	56.50	61.60	54.60	50.60	48.60	37.25	39.35	38.60	37.90	29.70	35.30	43.00	45.00	45.20	48.00	53.00	49.00
March.....	57.75	61.60	53.00	50.60	47.20	37.25	38.60	38.75	37.90	28.40	35.30	43.00	45.00	45.20	51.00	53.00	49.00
April.....	58.50	61.60	52.60	50.60	47.35	36.25	37.40	39.50	35.40	28.20	35.30	43.00	45.00	45.20	53.00	53.00	49.00
May.....	58.50	61.60	50.85	50.60	45.80	37.60	35.85	39.90	34.15	28.20	35.30	43.00	45.00	45.20	53.00	53.00	49.00
June.....	61.35	61.60	50.60	50.60	44.42	37.60	35.10	39.90	33.70	28.20	38.30	44.00	45.15	45.20	53.00	52.20	49.00
July.....	62.30	60.60	50.60	50.60	42.75	37.60	33.20	39.30	32.90	28.73	38.30	45.00	45.20	45.90	53.00	49.00	49.00
Aug.....	62.62	59.60	50.60	50.60	39.65	36.60	33.60	38.90	32.90	31.10	38.30	45.00	45.20	45.90	53.00	49.00	49.00
Sept.....	63.60	56.60	50.60	49.85	37.25	35.60	33.60	38.90	32.90	31.30	38.30	45.00	45.20	45.90	53.00	49.00	49.00
Oct.....	63.60	56.35	50.60	49.60	36.50	35.60	34.60	38.90	32.90	33.30	38.00	45.00	45.20	45.90	53.00	49.00	52.20
Nov.....	63.60	55.60	50.60	49.60	36.25	37.32	34.60	38.65	32.90	33.30	43.00	45.00	45.20	45.90	53.00	49.00	52.20
Dec.....	63.60	55.20	50.60	49.10	37.00	39.40	34.60	37.90	32.50	34.30	43.00	45.00	45.20	47.90	53.00	49.00	52.20
Aver.....	60.67	59.46	51.66	50.26	42.61	37.11	35.84	38.78	34.60	30.41	37.81	44.08	45.11	45.71	52.00	50.93	49.80

Cast Iron Pipe at Chicago, Net Ton 6-in. and Larger

	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$51.50	\$56.20	\$48.70	\$49.20	\$44.32	\$35.00	\$43.33	\$42.20	\$43.00	\$40.40	\$40.00	\$44.00	\$47.00	\$48.40	\$50.00	\$55.00	\$51.00
Feb.....	53.20	56.20	49.95	49.20	43.70	35.83	44.45	44.95	44.00	40.40	40.90	44.00	47.00	48.10	50.00	55.00	51.00
March.....	54.20	56.20	47.60	49.20	44.20	35.70	44.70	45.20	43.20	38.00	41.40	44.00	47.00	48.00	53.00	55.00	51.00
April.....	57.20	56.20	46.70	49.20	43.95	36.20	44.20	45.20	43.00	36.40	41.40	44.00	47.36	48.40	55.00	55.00	51.00
May.....	60.20	55.20	47.07	49.20	43.20	37.80	44.20	45.15	43.00	36.40	41.40	44.00	48.40	48.40	55.00	55.00	51.00
June.....	60.20	54.70	48.20	48.90	42.70	40.20	45.20	45.00	42.20	36.40	42.90	45.50	48.40	48.40	55.00	54.20	51.00
July.....	60.20	54.80	47.70	47.95	41.58	40.80	45.20	45.00	42.00	34.40	43.40	47.00	48.40	48.40	55.00	51.00	51.00
Aug.....	60.20	53.45	49.20	48.30	37.40	42.20	45.20	44.75	42.00	35.20	43.40	47.00	48.40	48.40	55.00	51.00	51.00
Sept.....	59.95	51.80	49.20	47.58	34.58	42.20	45.20	43.60	42.00	38.40	43.40	47.00	48.40	48.40	55.00	51.00	51.00
Oct.....	57.40	49.70	49.20	47.20	34.20	43.00	43.70	44.00	41.60	38.40	43.00	47.00	48.40	48.40	55.00	51.00	54.80
Nov.....	55.45	48.20	50.20	46.70	34.50	45.20	43.70	44.00	40.50	38.40	43.20	47.00	48.40	48.40	55.00	51.00	54.80
Dec.....	55.20	47.60	50.20	46.70	35.08	43.10	43.70	43.60	40.20	38.40	44.00	47.00	48.40	50.00	55.00	51.00	54.80
Aver.....	57.10	53.35	48.66	48.32	39.96	39.77	44.59	44.39	42.23	37.60	42.37	45.63	47.80	48.47	54.00	52.93	51.95

Standard Steel Pipe at Pittsburgh, Net Ton

Computed from list discounts, for carload lots; price for base size pipe, 1 to 3 in.; ¾ to 3 in. prior to April 13, 1931

	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$61.13	\$70.30	\$70.30	\$70.30	\$70.30	\$68.60	\$70.30	\$70.30	\$66.50	\$64.84	\$65.00	\$61.75	\$68.40	\$68.40	\$61.00	\$71.00	\$63.00
Feb.....	66.50	70.30	70.30	70.30	70.30	68.60	70.30	70.30	66.50	64.84	65.00	61.75	68.40	64.98	61.00	71.00	63.00
March.....	66.50	70.30	70.30	70.30	70.30	68.60	70.30	70.30	66.50	64.84	65.00	61.75	68.40	61.80	69.00	71.00	63.00
April.....	68.02	70.30	70.30	70.30	70.30	69.88	70.30	66.50	66.50	64.84	58.00	63.41	68.40	61.00	71.00	71.00	63.00
May.....	70.30	70.30	70.30	70.30	70.30	70.30	70.30	66.50	63.59	64.84	58.00	68.40	68.40	61.00	71.00	71.00	63.00
June.....	70.30	70.30	70.30	70.30	70.30	70.30	70.30	66.50	64.84	64.84	58.00	68.40	68.40	61.00	71.00	71.00	63.00
July.....	70.30	70.30	70.30	70.30	70.30	70.30	70.30	66.50	64.84	64.84	61.75	68.40	68.40	61.00	71.00	63.00	63.00
Aug.....	70.30	70.30	70.30	70.30	70.30	70.30	70.30	66.50	64.84	64.84	61.75	68.40	68.40	61.00	71.00	63.00	63.00
Sept.....	70.30	70.30	70.30	70.30	70.30	70.30	70.30	66.50	64.84	65.00	61.75	68.40	68.40	61.00	71.00	63.00	63.00
Oct.....	70.30	70.30	70.30	70.30	68.54	70.30	70.30	66.50	64.84	65.00	61.75	68.40	68.40	61.00	71.00	63.00	63.00
Nov.....	70.30	70.30	70.30	70.30	66.79	70.30	70.30	66.50	64.84	65.00	61.75	68.40	68.40	61.00	71.00	63.00	63.00
Dec.....	70.30	70.30	70.30	70.30	66.79	70.30	70.30	66.50	64.84	65.00	61.75	68.40	68.40	61.00	71.00	63.00	63.00
Aver.....	68.71	70.30	70.30	70.30	69.67	69.84	70.30	67.46	65.29	64.89	61.65	66.32	68.40	62.01	69.17	67.00	63.00

Wrought Iron Pipe at Pittsburgh, Net Ton

Computed from list discounts, for carload lots; price for base size pipe, 1½ in.; 1½ and 2 in. prior to Oct. 1, 1932.

	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$122.56	\$131.10	\$131.10	\$127.82	\$127.82	\$127.82	\$118.56	\$118.56	\$118.56	\$118.56	\$120.00	\$113.00	\$113.00	\$113.00	\$119.75	\$132.00	\$124.00
Feb.....	127.82	131.10	131.10	127.82	127.82	127.82	118.56	118.56	118.56	118.71	120.00	113.00	113.00	113.00	122.00	132.00	124.00
March.....	127.82	131.10	127.82	127.82	127.82	127.82	118.56	118.56	118.56	114.85	120.00	113.00	113.00	113.00	122.00	132.00	124.00
April.....	129.02	131.10	127.82	127.82	127.82	127.82	118.56	118.56	118.56	114.85	114.75	113.00	113.00	113.00	122.00	132.00	124.00
May.....	131.10	131.10	127.82	127.82	127.82	127.82	118.56	118.56	118.56	114.85	113.00	113.00	113.00	113.00	127.00	132.00	124.00
June.....	131.10	131.10	127.82	127.82	127.82	127.82	118.56	118.56	118.56	114.85	113.00	113.00	113.00	113.00	132.00	132.00	124.00
July.....	131.10	131.10	127.82	127.82	127.82	127.82	118.56	118.56	118.56	114.85	113.00	113.00	113.00	113.00	132.00	124.00	124.00
Aug.....	131.10	131.10	127.82	127.82	127.82	127.82	118.56	118.56	118.56	114.85	113.00	113.00	113.00	113.00	132.00	124.00	124.00
Sept.....	131.10	131.10	127.82	127.82	127.82	127.82	118.56	118.56	118.56	116.14	113.00	113.00	113.00	113.00	132.00	124.00	124.00
Oct.....	131.10	131.10	127.82	127.82	127.82	127.82	118.56	118.56	118.56	120.00	113.00	113.00	113.00	113.00	132.00	124.00	124.00
Nov.....	131.10	131.10	127.82	127.82	127.82	127.82	118.56	118.56	118.56	120.00	113.00	113.00	113.00	113.00	132.00	124.00	124.00
Dec.....	131.10	131.10	127.82	127.82	127.82	127.82	118.56	118.56	118.56	120.00	113.00	113.00	113.00	113.00	132.00	124.00	124.00
Aver.....	129.67	131.10	128.37	127.82	127.82	127.82	118.66	118.56	118.56	116.71	114.90	113.00	113.00	113.00	128.06	128.00	124.00

Lake Superior Iron Ores, Dollars Per Gross Ton, at Lake Erie Ports

YEAR	Bessemer Ores				Non-Bessemer Ores			
	Analysis Guarantee		Price		Analysis Guarantee		Price	
	Iron Natural	Phosphorus Dry	Old Range	Mesaba	Iron Natural	Old Range	Mesaba	High Phosphorus
1914.....	55.00	0.045	\$3.75	\$3.50	51.50	\$3.00	\$2.85	....
1915.....	55.00	0.045	3.75	3.45	51.50	3.00	2.80	....
1916.....	55.00	0.045	4.45	4.20	51.50	3.70	3.55	....
1917.....	55.00	0.045	5.95	5.70	51.50	5.20	5.05	....
1918 to July 1.....	55.00	0.045	5.95	5.70	51.50	5.20	5.05	....
1918—July 1 to Sept. 30.....	55.00	0.045	6.40	6.15	51.50	5.65	5.50	....
1918—Oct. 1 to Close...	55.00	0.045	6.65	6.40	51.50	5.90	5.75	....
1919.....	55.00	0.045	6.45	6.20	51.50	5.70	5.55	\$5.35
1920.....	55.00	0.045	7.45	7.20	51.50	6.70	6.55	6.35
1921.....	55.00	0.045	6.45	6.20	51.50	5.70	5.55	5.35
1922.....	55.00	0.045	5.95	5.70	51.50	5.20	5.05	4.85
1923.....	55.00	0.045	6.45	6.20	51.50	5.70	5.55	5.35
1924.....	55.00	0.045	4.65	5.40	51.50	4.90	4.75	4.55
1925 through 1928.....	51.50	0.045	4.55	4.40	51.50	4.40	4.25	4.15
1929 through 1936.....	51.50	0.045	4.80	4.65	51.50	4.65	4.50	4.40
1937 through 1939.....	51.50	0.045	5.25	5.10	51.50	5.10	4.95	4.85

Non-Ferrous Metals*

(From THE IRON AGE)

Electrolytic Copper at New York, Cents a Pound

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan....	13.55	14.52	12.46	14.73	13.84	12.99	13.85	16.59	17.75	9.79	7.12	4.75	7.92	8.75	9.00	12.41	10.18	11.00
Feb....	12.92	15.34	12.73	14.49	14.00	12.69	13.82	17.74	17.75	9.71	6.07	4.75	7.75	8.75	9.00	13.44	9.75	11.00
March..	12.68	16.84	13.52	14.06	13.86	13.08	13.90	21.25	17.75	9.88	5.76	5.00	7.75	8.75	9.00	15.75	9.75	11.00
April...	12.61	16.81	13.21	13.30	13.69	12.81	14.13	19.69	15.67	9.48	5.54	5.39	8.16	8.75	9.14	15.10	9.75	10.22
May....	13.13	15.54	12.76	13.34	13.60	12.65	14.19	17.75	12.76	8.67	5.25	6.68	8.25	8.75	9.25	13.75	9.35	9.81
June...	13.62	14.74	12.35	13.41	13.64	12.37	14.50	17.75	12.09	8.05	5.11	7.75	8.75	9.63	9.25	13.75	8.76	9.75
July...	13.71	14.39	12.39	13.95	13.91	12.51	14.50	17.75	11.02	7.67	5.04	8.63	8.75	7.75	9.35	13.75	9.56	9.98
Aug....	13.74	13.87	13.26	14.48	14.10	13.00	14.50	17.75	10.65	7.26	5.15	8.75	8.75	7.92	9.50	13.75	9.87	10.24
Sept....	13.75	13.36	12.97	14.42	14.05	12.93	14.70	17.75	10.39	6.98	5.95	8.75	8.75	8.52	9.50	13.53	10.00	11.68
Oct....	13.66	12.58	12.96	14.29	13.88	12.98	15.16	17.75	9.60	6.75	5.72	7.97	8.75	8.94	9.54	11.81	10.74	12.19
Nov....	13.62	12.76	13.59	14.36	13.59	13.34	15.75	17.75	10.17	6.54	5.07	7.91	8.75	9.00	10.16	10.77	11.00	12.25
Dec....	14.00	12.88	14.23	13.82	13.31	13.79	15.84	17.75	10.29	6.60	4.78	7.87	8.75	9.00	10.73	9.98	11.00	12.25
Aver..	13.48	14.47	13.04	14.05	13.80	13.93	14.57	18.11	13.99	8.11	5.55	7.08	8.41	8.63	9.45	13.16	9.98	10.95

Zinc at New York, Cents a Pound

	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan....	7.38	9.62	5.83	5.06	7.28	6.78	8.10	8.75	7.03	6.00	6.70	5.59	4.37	3.38	3.38	4.62	4.08	5.22	6.20	5.35	4.89
Feb....	6.70	9.14	5.36	4.85	7.58	7.11	7.86	8.16	7.04	5.90	6.70	5.53	4.36	3.19	3.04	4.73	4.06	5.23	6.80	5.17	4.89
March..	6.52	8.93	5.20	5.00	8.19	6.85	7.68	7.69	7.06	5.98	6.80	5.30	4.30	3.16	3.37	4.72	4.25	5.27	7.75	4.77	4.89
April...	6.51	8.63	5.24	5.25	7.65	6.49	7.35	7.36	6.69	6.11	7.04	5.19	4.06	3.10	3.68	4.72	4.38	5.27	7.70	4.53	4.89
May....	6.46	8.08	5.28	5.45	6.99	6.13	7.30	7.16	6.43	6.37	6.98	4.98	3.66	2.90	4.17	4.71	4.60	5.27	7.10	4.43	4.89
June...	6.93	7.92	4.95	5.69	6.40	6.14	7.35	7.47	6.57	6.50	7.00	4.79	3.75	3.16	4.70	4.59	4.67	5.26	7.10	4.53	4.89
July...	7.90	8.18	4.77	6.12	6.43	6.25	7.60	7.76	6.58	6.55	7.10	4.66	4.25	2.92	5.24	4.68	4.70	5.16	7.27	5.14	4.91
Aug....	7.84	8.31	4.69	6.59	6.68	6.53	7.55	7.69	6.70	6.59	7.15	4.72	4.17	3.13	5.28	4.63	4.92	5.17	7.56	5.14	5.11
Sept....	7.57	7.82	4.74	6.91	6.81	6.54	8.12	7.76	6.56	6.60	7.15	4.62	4.09	3.68	5.08	4.43	5.04	5.22	7.54	5.24	6.51
Oct....	7.83	7.51	5.10	7.20	6.66	6.67	8.65	7.66	6.35	6.60	7.09	4.40	3.73	3.41	5.12	4.19	5.21	5.22	6.45	5.40	6.89
Nov....	8.14	6.84	5.18	7.48	6.70	7.14	9.04	7.56	6.09	6.62	6.63	4.63	3.55	3.46	4.87	4.08	5.23	5.35	5.98	5.12	6.89
Dec....	8.59	6.00	5.25	7.46	6.60	7.73	8.97	7.39	6.15	6.70	6.09	4.43	3.50	3.50	4.82	4.06	5.22	5.04	5.36	4.89	6.46
Aver..	7.36	8.08	5.13	6.09	7.00	6.70	7.96	7.70	6.60	6.39	6.87	4.90	3.98	3.25	4.40	4.51	4.70	5.27	6.90	4.98	5.51

Lead at New York, Cents a Pound

	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan....	5.56	8.67	5.00	4.70	7.85	8.31	10.26	9.25	7.59	6.50	6.65	6.25	4.80	3.75	3.00	4.00	3.69	4.50	6.00	4.87	4.83
Feb....	5.05	8.88	4.54	4.70	8.14	9.01	9.38	9.08	7.40	6.34	6.85	6.24	4.55	3.72	3.00	4.00	3.53	4.51	6.23	4.63	4.80
March..	5.23	9.21	4.08	4.71	8.47	9.23	8.90	8.46	7.57	6.00	7.41	5.66	4.53	3.15	3.15	4.00	3.58	4.60	7.19	4.50	4.82
April...	5.03	8.95	4.33	5.13	8.19	8.19	8.01	7.91	7.10	6.10	7.19	5.58	4.42	3.00	3.27	4.18	3.69	4.60	6.32	4.50	4.78
May....	5.05	8.55	4.99	5.51	7.39	7.27	8.08	7.75	6.60	6.13	7.00	5.51	3.82	3.00	3.65	4.14	3.96	4.60	6.00	4.40	4.75
June...	5.34	8.48	4.56	5.73	7.14	7.08	8.35	8.08	6.42	6.30	7.00	5.41	3.92	2.99	4.17	3.98	4.02	4.60	6.00	4.15	4.80
July...	5.65	8.67	4.40	5.75	6.28	7.15	8.33	8.60	6.33	6.22	6.80	5.25	4.40	2.73	4.46	3.77	4.12	4.60	6.00	4.88	4.85
Aug....	5.77	8.98	4.40	5.88	6.74	8.02	9.52	8.96	6.99	6.25	6.75	5.49	4.40	3.24	4.50	3.75	4.25	4.60	6.45	4.90	5.04
Sept....	6.12	8.11	4.60	6.20	7.06	8.09	9.60	8.80	6.30	6.45	6.88	5.50	4.40	3.47	4.50	3.68	4.41	4.60	6.40	5.00	5.45
Oct....	6.45	7.24	4.70	6.67	6.84	8.31	9.62	8.40	6.25	6.50	6.87	5.17	3.97	3.05	4.32	3.65	4.51	4.63	5.75	5.10	5.50
Nov....	6.76	6.33	4.70	7.20	6.87	8.96	9.84	8.00	6.27	6.39	6.29	5.10	3.94	3.04	4.29	3.57	4.50	5.11	5.03	5.09	5.50
Dec....	7.03	4.80	4.70	7.28	7.61	9.61	9.36	7.87	6.52	6.49	6.25	5.10	3.80	3.00	4.14	3.60	4.50	5.55	4.87	4.84	5.50
Aver..	6.76	8.07	4.58	5.79	7.39	8.27	9.10	8.39	6.75	6.31	6.83	5.58	4.24	3.18	3.87	3.86	4.06	4.71	6.08	4.74	5.05

Straits Tin at New York, Cents a Pound

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan....	32.03	39.16	48.70	58.26	62.20	66.43	55.56	49.21	38.84	26.03	21.80	22.70	51.98	50.91	47.23	50.90	41.54	46.39
Feb....	30.74	41.98	53.41	57.09	63.65	69.05	82.47	49.39	38.63	26.27	21.97	23.51	51.78	49.99	47.94	52.10	41.23	45.64
March..	29.14	48.61	55.03	53.67	64.47	69.23	52.11	48.85	36.76	27.02	21.81	24.35	53.84	48.88	48.00	62.74	41.16	46.17
April...	30.58	45.84	50.02	52.67	63.35	67.88	52.28	45.93	35.90	25.13	19.17	27.16	55.66	50.05	46.97	59.02	38.41	47.16
May....	30.92	43.11	44.08	54.65	62.36	67.47	51.53	43.88	32.16	23.16	20.90	35.94	53.57	51.10	46.31	55.64	36.83	49.00
June...	31.46	40.97	42.74	55.93	60.63	67.42	47.92	44.20	30.26	23.53	19.58	44.23	51.31	51.08	42.24	55.88	40.36	48.81
July...	31.67	38.47	46.29	58.05	62.98	64.01	47.01	46.29	29.76	24.96	20.89	46.28	51.94	52.31	42.96	59.34	43.38	48.53
Aug....	32.36	39.33	41.89	58.12	65.17	64.41	47.97	46.20	30.00	25.73	22.98	44.71	51.99	50.46	42.57	59.40	43.26	48.80
Sept....	32.36	41.60	49.24	58.27	68.89	61.43	48.06	45.32	29.59	24.51	24.76	46.46	51.52	49.05	44.77	58.64	43.40	Nominal
Oct....	34.61	41.80	50.60	62.24	70.36	58.49	48.99	42.25	26.76	22.72	23.91	47.95	51.01	51.25	44.95	51.52	45.25	55.68
Nov....	36.76	44.09	54.25	63.30	70.75	57.49	50.76	40.18	25.87	22.78	23.31	53.14	51.24	51.88	51.30	43.34	46.29	52.65
Dec....	37.48	47.16	56.03	62.94	68.68	58.54	50.23	39.87	25.01	21.28	22.70	52.91	50.92	49.77	51.85	42.96	46.21	51.40
Aver..	32.51	42.68	50.19	57.90	64.89	64.32	50.39	45.16	31.63	24.43	21.98	39.12	52.33	50.39	46.42	54.29	42.28	49.1

Aluminum (No. 1 Virgin, 99 Per Cent Plus), at New York, Cents a Pound, Less-than-ton Lots

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan....	17.74	22.75	27.61	27.00	27.00	26.37	23.90	23.90	23.90	20.50	19.50	19.00	19.75	21.00	21.00	21.00	21.00	21.00
Feb....	17.33	23.25	27.71	27.00	27.00	25.83	23.90	23.90	23.90	20.50	19.50	19.00	19.75	21.00	21.00	21.00	21.00	21.00
March..	17.52	24.95	27.57	27.00	27.00	25.55	23.90	23.90	23.90	20.00	19.00	19.00	20.00	21.00	21.00	21.00	21.00	21.00
April...	18.07	26.00	27.46	27.00	27.00	25.55	23.90	23.90	20.50	19.50	18.50	19.50	20.00	21.00	21.00	21.00	21.00	21.00

Monthly Average Scrap Prices* Computed from

No. 1 Heavy Melting Steel

Average of Pittsburgh, Chicago and

	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919
Jan.....	\$19.75	\$11.40	\$16.19	\$16.51	\$18.12	\$11.85	\$15.84	\$16.90	\$12.50	\$11.77	\$14.02	\$10.29	\$10.27	\$16.46	\$21.73	\$29.93	\$17.77
Feb.....	19.82	12.31	15.79	15.52	17.50	13.54	14.92	16.42	13.15	11.46	13.06	11.39	10.39	16.10	21.35	29.92	14.75
March.....	20.02	13.17	15.99	14.50	17.62	12.58	13.27	16.10	13.43	11.71	13.10	11.10	10.78	17.28	23.60	29.58	14.52
April.....	20.20	13.19	15.98	14.98	17.48	12.20	13.20	15.69	12.63	12.44	13.39	10.83	10.61	17.42	26.63	28.47	15.79
May.....	19.81	11.46	14.50	14.93	17.55	12.08	14.33	14.54	12.07	12.85	12.30	10.60	10.79	16.47	27.63	28.79	15.06
June.....	19.00	10.65	13.47	14.84	17.79	12.67	15.33	14.23	12.06	12.94	11.60	10.57	10.78	15.25	37.21	28.87	16.54
July.....	18.33	10.29	13.97	14.92	17.27	13.27	15.25	13.67	12.21	12.82	11.42	10.50	11.65	15.19	36.00	29.00	19.13
Aug.....	17.29	10.79	14.52	15.78	16.57	13.73	16.06	13.43	12.50	13.19	11.46	10.42	13.00	15.35	31.30	29.00	20.25
Sept.....	15.62	11.13	15.32	17.11	16.21	14.15	16.93	13.50	11.94	13.73	11.35	10.30	13.79	15.67	31.50	29.00	18.87
Oct.....	13.98	12.00	15.85	17.28	15.72	14.55	17.46	13.44	11.27	14.90	11.00	9.71	13.62	16.90	26.60	29.00	18.67
Nov.....	12.12	13.85	16.75	18.07	13.48	15.56	17.17	13.30	11.02	14.69	10.39	9.13	14.63	20.40	27.83	28.50	20.50
Dec.....	10.48	15.52	16.79	18.88	12.00	16.32	17.17	12.75	11.52	14.00	9.97	9.50	16.20	24.13	28.87	25.00	22.77
Aver.....	17.90	12.16	15.43	16.11	16.44	13.54	15.58	14.60	12.19	13.04	11.98	10.36	12.21	17.22	28.35	28.78	17.89

Scrap Prices at Pittsburgh, Gross Ton

No. 1 Heavy Melting Steel

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$14.30	\$21.80	\$21.38	\$21.50	\$18.63	\$16.88	\$15.10	\$19.31	\$16.69	\$13.19	\$10.22	\$8.30	\$13.00	\$13.35	\$14.44	\$19.50	\$14.25	\$15.72
Feb.....	14.00	23.25	20.88	19.50	17.50	16.13	14.94	18.63	16.81	12.88	10.25	8.50	14.00	13.06	14.96	19.81	14.13	15.72
March.....	15.13	25.38	19.38	18.50	17.55	16.55	14.81	18.44	16.56	12.80	10.25	8.88	14.44	12.19	15.75	23.15	13.67	15.97
April.....	16.38	25.88	16.20	17.00	16.63	16.50	15.31	18.60	15.95	12.39	10.12	10.00	14.19	11.55	15.75	22.25	12.44	15.41
May.....	17.30	22.80	15.63	16.75	15.69	15.40	15.25	17.88	15.25	11.25	9.60	11.75	12.80	11.62	14.50	19.38	11.50	14.48
June.....	17.00	21.13	16.00	17.30	15.75	14.81	14.56	18.25	15.13	10.30	8.75	11.75	11.75	11.75	13.57	18.45	11.30	15.12
July.....	17.38	18.10	17.50	18.00	16.81	15.00	14.10	18.55	14.75	10.56	8.25	12.72	11.75	11.95	14.19	19.75	14.25	15.56
Aug.....	17.75	17.75	17.50	18.88	17.50	15.40	15.50	19.00	15.13	10.69	8.60	13.85	11.31	12.94	15.94	21.85	15.45	16.15
Sept.....	20.13	17.88	18.10	18.70	17.88	15.50	16.56	18.31	15.60	10.65	9.54	12.94	10.75	13.25	17.80	19.62	15.25	19.88
Oct.....	21.40	15.70	18.50	18.50	17.25	14.75	17.60	17.30	14.56	10.22	9.62	12.15	10.35	13.40	17.87	16.62	15.00	23.05
Nov.....	20.50	16.13	19.63	19.50	17.20	14.25	17.19	16.39	13.19	10.22	9.15	11.50	10.94	13.56	17.31	13.75	15.28	20.56
Dec.....	20.13	18.75	21.40	19.10	16.75	14.88	17.90	15.45	12.75	10.25	8.75	12.13	13.01	14.05	18.31	13.75	15.75	18.58
Aver.....	17.68	20.58	18.51	18.60	17.10	15.50	15.74	18.01	15.20	11.88	9.48	11.81	12.36	12.78	15.87	18.86	14.08	17.17

Machine Shop Turnings

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$9.60	\$16.90	\$15.75	\$17.50	\$14.30	\$12.00	\$10.80	\$11.50	\$11.50	\$8.00	\$6.50	\$6.25	\$8.70	\$8.70	\$9.87	\$14.00	\$8.22	\$10.05
Feb.....	9.56	18.50	16.13	15.88	13.63	11.38	10.88	11.50	11.39	6.44	6.50	6.25	10.25	8.75	10.25	14.00	8.25	10.25
March.....	10.50	20.38	14.50	14.20	13.35	12.00	10.25	10.63	10.94	7.65	6.75	6.25	11.00	7.31	10.50	14.50	7.75	10.25
April.....	11.88	20.50	12.45	13.39	12.00	12.63	10.44	11.15	10.90	7.06	6.56	6.81	10.38	7.30	10.50	14.37	7.60	9.62
May.....	13.30	19.20	11.88	12.25	11.00	11.30	10.20	11.06	10.19	6.57	6.00	8.30	8.35	8.06	9.69	14.31	6.75	9.20
June.....	13.32	17.19	13.00	13.05	11.00	10.50	9.00	11.63	9.56	6.50	5.12	8.38	7.25	8.12	9.05	13.85	6.55	9.25
July.....	14.00	12.10	13.50	13.63	11.38	11.50	9.10	11.90	8.60	6.75	4.75	9.50	7.50	8.10	9.37	14.25	8.50	9.25
Aug.....	14.00	11.44	14.13	15.00	12.80	11.80	9.88	13.00	8.00	7.00	5.30	10.50	7.50	8.88	10.62	15.65	9.80	9.95
Sept.....	14.75	12.88	14.40	14.75	13.06	11.63	11.13	12.06	8.00	7.30	6.00	10.00	7.13	9.50	12.20	14.50	9.75	12.00
Oct.....	16.20	11.60	14.25	14.39	12.06	11.50	11.10	11.75	6.88	7.00	6.00	9.30	6.75	9.50	12.25	11.62	9.75	14.80
Nov.....	16.63	11.63	15.94	15.00	11.90	11.10	11.00	11.00	6.00	6.94	6.00	7.75	7.13	9.44	11.50	8.45	9.75	14.19
Dec.....	15.63	13.75	17.20	14.30	11.50	11.00	11.10	10.25	6.00	6.70	6.12	8.00	8.70	9.60	12.37	7.50	10.00	12.92
Aver.....	13.28	15.51	14.43	14.44	12.34	11.53	10.41	11.46	8.98	6.83	5.97	8.11	8.39	8.61	10.68	13.08	8.55	10.97

Cast Iron Borings

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$10.90	\$18.40	\$16.94	\$17.50	\$14.88	\$12.50	\$11.30	\$12.88	\$11.25	\$7.50	\$6.50	\$5.50	\$7.50	\$6.35	\$8.50	\$14.00	\$6.94	\$8.55
Feb.....	11.06	19.50	16.88	15.88	14.13	12.13	11.00	12.50	11.56	7.50	6.50	5.50	7.88	6.75	8.75	14.00	7.00	8.75
March.....	11.94	21.13	15.38	14.10	13.30	12.50	10.50	12.25	11.00	7.70	6.70	5.50	8.50	6.37	10.50	14.40	6.25	8.91
April.....	13.38	21.88	13.00	13.39	12.50	12.38	11.90	12.45	10.55	7.50	6.56	5.88	8.50	6.00	10.50	14.25	6.25	9.00
May.....	14.10	20.20	12.75	12.50	11.75	11.10	10.90	12.00	10.39	7.63	6.10	7.30	8.10	6.00	10.12	14.00	6.25	7.55
June.....	14.63	17.88	14.00	13.05	11.90	10.50	10.39	12.25	9.88	6.75	5.12	7.88	7.00	6.25	10.00	14.30	6.10	7.19
July.....	16.00	15.20	13.80	13.63	12.38	10.63	10.00	12.40	8.90	7.25	4.50	9.25	7.00	6.30	10.00	14.87	6.63	8.60
Aug.....	15.70	13.88	14.75	15.00	12.75	11.00	10.75	12.75	8.50	7.56	5.30	9.95	7.00	6.63	10.62	15.45	8.00	9.25
Sept.....	17.00	15.63	14.90	14.75	12.94	11.00	12.13	12.25	8.65	7.20	6.00	8.88	6.75	7.00	12.30	14.87	8.50	11.06
Oct.....	18.60	13.50	15.00	14.39	12.50	11.00	12.50	12.25	8.00	7.25	6.00	8.20	5.50	8.00	12.50	12.75	8.50	13.95
Nov.....	17.85	12.75	15.13	15.00	12.90	11.00	12.13	11.63	7.75	6.94	6.00	7.75	5.25	8.00	12.25	8.55	8.80	13.44
Dec.....	17.50	14.88	16.70	14.90	12.13	11.13	12.00	10.75	7.40	6.70	5.50	7.50	5.40	8.00	12.87	6.75	8.50	12.25
Aver.....	14.89	17.07	14.94	14.51	12.84	11.57	11.22	12.20	9.49	7.29	5.89	7.42	7.03	6.80	10.74	13.18	7.88	9.87

No. 1 Cast Cupola Scrap

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$16.30	\$23.30	\$21.00	\$19.63	\$17.50	\$16.00	\$14.50	\$16.00	\$14.00	\$12.00	\$9.50	\$8.60	\$11.40	\$12.80	\$14.00	\$17.12	\$16.25	\$15.50
Feb.....	16.00	24.75	21.38	20.13	17.00	15.56	14.50	15.00	14.00	12.00	9.50	8.50	12.25	13.37	14.00	17.50	16.25	15.50
March.....	15.94	26.75	20.25	18.60	17.00	15.80	14.50	15.13	14.00	12.00	9.20	8.50	13.50	12.50	14.80	19.20	15.65	15.50
April.....	16.88	27.75	18.50	17.75	16.50	16.00	14.50	14.38	14.00	12.00	9.00	8.75	13.50	12.00	15.00	20.00	14.33	15.38
May.....	18.50	26.30	17.88	17.50	16.50	15.70	14.50	15.50	14.00	10.75	8.90	9.90	12.80	12.63	15.00	19.37	13.88	15.25
June.....	18.75	24.13	17.25	17.10	15.90	15.13	14.25	15.50	14.00	10.00	8.50	10.00	12.00	13.00	14.60	18.30	13.45	15.25
July.....	19.00	21.10	17.80	17.00	15.75	15.00	14.25	15.50	13.00	10.00	8.87	10.63	12.00	13.00	14.50	19.25	14.63	15.25
Aug.....	19.00	21.38	18.00	17.50	16.80	15.00	14.50	15.50	13.00	10.50	9.00	11.50	11.75	13.44	15.50	20.25	15.25	15.60
Sept.....	22.13	21.75	18.00	17.40	16.50	15.00	14.94	15.50	13.00	10.10	9.50	11.50	11.50	14.00	15.90	19.75	15.44	19.94
Oct.....	24.00	19.50	18.00	17.39	16.00	14.75	15.40	15.50	12.88	9.50	9.50	11.50	11.00	14.00	16.00	18.38	15.50	22.95
Nov.....	23.13	18.63	18.13	18.00	16.30	14.35	15.00	15.13	12.13	9.50	9.10	11.00	11.19	14.00	16.00	16.65	15.50	21.00
Dec.....	22.38	20.00	19.10	17.70	16.00	14.38	14.80	14.50	12.00	9.50	9.00	11.00	12.25	14.00	16.50	16.25	15.50	19.42
Aver.....	19.33	22.95	18.77	17.98	16.48	15.22	14.64	16.34	15.33	10.65	9.13	10.12	12.09	13.23	15.15	18.60	15.13	17.21

Weekly Quotations in THE IRON AGE

Scrap Composite Price

Philadelphia Quotations, Gross Ton

	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan...	\$25.13	\$15.04	\$12.45	\$20.22	\$19.15	\$20.10	\$16.97	\$15.17	\$13.70	\$17.02	\$14.65	\$11.30	\$8.41	\$6.77	\$11.73	\$12.29	\$13.47	\$18.33	\$14.00	\$14.94
Feb...	26.00	15.21	12.46	21.46	19.21	18.27	15.50	14.58	13.71	16.96	14.92	11.15	8.27	6.83	12.25	11.98	14.12	19.27	13.86	15.01
March...	25.50	13.17	13.46	24.79	17.56	16.92	15.83	14.65	13.65	16.71	14.88	11.10	8.23	6.96	12.82	11.06	14.75	21.25	13.46	15.20
April...	24.42	11.63	14.71	24.00	15.20	15.48	15.27	14.71	13.81	17.18	14.30	10.83	8.12	7.73	12.54	10.46	14.59	21.02	12.40	14.77
May...	23.71	12.20	15.67	20.77	14.71	15.46	14.35	13.95	13.90	16.54	13.71	9.94	7.48	9.70	11.57	10.70	13.39	18.54	11.54	14.17
June...	23.47	11.47	15.52	18.94	14.88	16.09	14.40	13.60	13.52	16.39	13.31	9.39	6.89	9.97	10.67	10.74	12.81	17.28	11.32	14.71
July...	24.21	11.00	15.92	17.23	16.00	16.46	15.42	13.48	13.13	16.60	13.08	9.25	6.46	11.27	10.53	10.96	13.29	18.79	13.29	14.92
Aug...	25.88	11.57	16.30	16.58	16.58	17.23	15.88	13.80	13.75	16.86	13.29	9.25	6.93	12.08	10.15	12.25	15.04	20.43	14.51	15.43
Sept...	26.53	12.15	18.33	16.98	17.20	17.42	16.25	13.92	14.75	16.60	13.70	9.12	7.69	11.35	9.63	12.71	16.45	18.73	14.34	18.32
Oct...	23.73	12.88	19.20	15.15	17.08	17.08	15.58	13.48	15.85	15.78	12.77	8.78	7.62	10.56	9.54	12.67	16.63	15.89	14.21	21.48
Nov...	20.00	12.73	18.02	15.13	18.17	17.63	15.25	13.18	15.73	14.83	11.69	8.74	7.45	9.94	10.04	12.90	16.31	13.34	14.74	19.66
Dec...	15.92	12.29	17.94	17.37	20.08	17.37	15.08	13.48	15.97	14.15	11.28	8.61	6.92	10.50	11.43	13.33	17.10	13.40	14.88	18.05
Aver.	\$5.71	\$8.61	\$6.85	\$9.05	\$7.15	\$7.18	\$5.43	\$4.00	\$4.29	\$6.30	\$5.48	\$3.80	\$2.54	\$2.47	\$11.07	\$11.85	\$14.83	\$18.03	\$15.84	\$16.59

Low-Phosphorus Scrap (Billet and Bloom Crops)

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan...	\$17.60	\$25.30	\$23.60	\$26.50	\$24.00	\$21.00	\$18.50	\$22.00	\$20.88	\$17.25	\$13.00	\$10.70	\$15.70	\$15.00	\$16.88	\$24.50	\$18.25	\$18.75
Feb...	17.13	27.50	25.13	24.75	22.25	20.25	18.50	22.00	21.25	18.00	13.00	10.50	16.25	15.00	17.12	25.50	18.25	18.75
March...	17.38	32.00	24.00	23.30	22.00	20.30	18.50	22.50	21.50	18.00	13.00	10.50	17.00	14.62	18.00	26.90	18.25	19.12
April...	18.88	32.25	19.40	22.13	21.13	21.00	18.50	23.45	21.40	17.50	13.00	11.00	17.00	14.55	18.00	27.50	17.50	19.12
May...	20.00	28.60	19.50	21.63	20.00	20.00	18.60	22.50	19.88	15.00	12.40	13.80	16.20	14.94	17.62	25.87	16.12	18.45
June...	20.00	25.88	20.13	22.00	20.00	19.25	19.00	22.25	19.13	14.10	10.87	14.00	15.25	15.00	17.50	25.00	15.00	18.75
July...	20.13	22.00	20.90	22.00	20.75	19.00	19.00	22.45	19.20	14.50	10.50	15.00	15.00	15.00	17.50	25.00	16.50	18.75
Aug...	21.20	23.50	21.88	22.25	21.00	19.00	19.13	23.00	19.33	14.60	10.50	16.80	14.25	15.50	18.62	26.85	17.75	19.75
Sept...	24.25	24.38	22.60	23.00	21.67	20.00	19.88	22.39	20.00	14.30	10.50	15.75	13.60	16.12	20.50	25.12	17.75	24.69
Oct...	25.00	21.90	23.00	23.13	20.50	19.25	20.20	21.75	18.75	13.50	11.00	15.20	13.00	16.50	21.00	21.37	17.75	29.75
Nov...	24.00	20.50	23.25	24.00	20.60	18.30	20.50	21.13	17.13	13.00	11.50	15.00	13.81	16.50	21.00	18.05	17.75	28.88
Dec...	24.00	21.75	25.13	24.00	21.13	18.50	21.00	20.75	17.00	13.00	11.00	15.06	14.81	16.50	22.12	18.25	17.87	25.08
Aver.	\$9.80	\$5.48	\$8.39	\$5.22	\$1.25	\$9.65	\$9.28	\$8.18	\$9.63	\$5.22	\$11.69	\$5.61	\$5.15	\$5.44	\$8.88	\$4.16	\$7.39	\$9.65

Eastern Pennsylvania Scrap Prices, Gross Ton

No. 1 Heavy Melting Steel

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan...	\$11.60	\$19.70	\$18.20	\$18.60	\$17.00	\$13.30	\$13.50	\$13.30	\$14.50	\$10.50	\$7.00	\$6.75	\$11.70	\$11.40	\$12.62	\$17.37	\$14.75	\$15.25
Feb...	12.00	20.75	18.38	17.63	15.88	14.63	13.50	16.39	14.63	10.50	7.00	6.75	11.75	11.62	13.25	18.50	14.75	15.25
March...	12.78	25.25	16.75	15.90	16.00	14.50	13.50	16.13	14.88	10.50	7.00	6.75	11.88	10.50	13.75	19.60	14.55	15.38
April...	14.00	23.63	15.30	14.63	16.00	14.60	13.50	17.00	13.85	10.31	7.50	7.19	11.69	10.00	13.69	20.00	13.87	15.62
May...	14.75	19.80	14.75	14.63	15.25	14.10	13.50	16.39	13.39	9.60	6.00	8.90	10.95	10.44	12.81	18.62	13.13	15.25
June...	15.00	17.88	15.00	15.10	14.70	14.00	13.39	16.00	12.75	9.10	6.00	9.25	10.50	10.50	12.00	17.20	12.20	15.41
July...	15.00	16.60	15.40	15.63	14.63	13.39	13.00	16.50	12.50	8.44	6.00	10.68	10.30	10.55	12.31	19.00	13.63	15.62
Aug...	15.20	16.00	16.75	16.38	16.20	13.70	13.00	16.50	12.63	8.69	6.30	11.95	9.94	11.44	14.00	19.75	14.35	16.25
Sept...	16.88	16.75	17.10	17.20	16.88	14.00	14.75	16.39	13.00	8.50	7.25	11.25	9.63	12.38	15.40	19.00	14.25	18.87
Oct...	17.80	15.40	16.63	16.75	16.50	14.00	16.00	15.70	12.38	8.13	7.25	10.20	9.53	12.10	15.75	16.38	14.75	22.35
Nov...	16.25	15.25	17.75	17.38	15.50	13.80	15.50	15.00	11.75	8.00	7.25	9.75	9.94	12.13	15.12	13.75	14.75	20.75
Dec...	16.38	16.75	20.10	17.50	15.50	13.50	15.40	14.50	11.10	7.75	6.75	10.44	10.75	12.50	15.50	14.25	15.12	18.92
Aver.	\$4.80	\$8.65	\$6.84	\$6.44	\$5.84	\$4.13	\$4.05	\$6.07	\$3.12	\$3.18	\$2.77	\$2.18	\$5.71	\$5.30	\$5.85	\$7.78	\$4.05	\$7.08

No. 1 Machinery Cast

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan...	\$16.50	\$23.20	\$20.70	\$20.13	\$18.30	\$17.00	\$16.00	\$16.21	\$15.00	\$12.00	\$10.00	\$8.00	\$12.00	\$10.90	\$13.00	\$18.50	\$16.75	\$16.75
Feb...	16.50	24.25	20.25	18.88	17.75	17.00	16.00	16.50	15.00	11.90	10.00	8.00	12.00	11.00	13.00	19.00	15.87	16.75
March...	17.13	28.25	18.63	18.00	17.50	17.00	16.00	16.50	15.00	11.50	9.90	8.00	12.78	11.00	14.00	20.40	15.75	16.75
April...	17.25	26.25	17.70	17.25	17.50	17.00	16.00	16.50	14.85	11.50	9.75	8.50	12.88	11.00	13.87	22.25	15.63	16.75
May...	18.40	24.30	17.00	17.00	17.25	16.80	16.00	16.50	14.00	11.50	8.12	10.25	12.10	11.00	13.50	20.87	14.63	16.30
June...	19.00	22.25	17.50	17.50	17.00	16.00	16.00	16.00	13.50	11.20	8.00	10.25	12.00	11.00	13.50	20.00	14.45	16.25
July...	17.50	20.40	17.50	17.63	17.00	16.00	15.50	16.50	13.00	11.00	6.50	11.81	11.60	11.00	14.12	20.37	15.75	16.37
Aug...	18.60	20.38	17.88	18.00	17.70	16.00	15.50	16.50	13.00	11.00	8.20	12.50	11.50	11.12	15.19	21.15	16.35	16.75
Sept...	21.50	21.38	18.00	18.00	18.00	16.38	16.25	16.88	13.00	11.00	9.25	12.50	11.50	11.50	16.30	20.38	16.25	19.19
Oct...	22.60	19.50	17.50	18.00	17.39	16.50	17.10	16.00	13.00	11.00	9.50	11.50	11.10	12.10	16.50	19.12	16.75	24.45
Nov...	21.00	19.25	17.88	18.00	17.30	16.13	16.39	15.88	12.00	11.00	9.31	11.25	10.50	12.50	16.50	16.65	16.75	22.63
Dec...	20.25	20.25	19.50	18.13	17.00	16.00	16.25	15.00	12.00	10.10	8.00	11.81	10.50	12.90	16.75	16.58	16.75	20.75
Aver.	\$8.85	\$5.47	\$8.34	\$8.04	\$7.48	\$6.48	\$6.08	\$6.28	\$3.61	\$1.23	\$3.88	\$5.38	\$11.70	\$11.48	\$14.60	\$19.68	\$18.97	\$18.81

Cast Iron Carwheels

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$16.50	\$22.30	\$20.10	\$19.50	\$18.13	\$16.38	\$15.50	\$16.50	\$15.00	\$13.75	\$10.75	\$8.00	\$11.00	\$11.50	\$13.75	\$18.37	\$16.25	\$16.75
Feb.....	15.00	24.75	20.38	18.38	17.50	16.00	15.50	16.50	15.00	13.50	10.00	8.00	12.50	12.25	14.50	18.50	15.37	16.75
March.....	15.94	26.50	18.75	18.50	17.50	16.00	15.50	16.50	15.00	13.40	9.70	8.00	12.88	11.87	14.50	19.30	15.75	16.75
April.....	15.88	26.50	17.50	17.75	17.50	16.00	15.50	16.50	15.00	12.63	10.00	8.75	13.00	11.00	14.37	21.25	15.57	16.50
May.....	24.20	17.00	17.00	17.00	17.25	16.00	15.50	16.39	14.88	12.25	8.94	9.75	12.50	11.00	13.62	20.62	14.75	16.00
June.....	17.13	22.75	17.00	17.00	17.00	15.38	15.50	16.00	14.50	12.00	8.25	10.25	11.38	11.00	13.50	19.50	14.75	16.00
July.....	17.50	20.40	17.30	17.25	17.00	15.00	15.50	16.39	14.50	12.00	7.00	12.00	11.00	11.00	13.87	19.75	15.25	16.00
Aug.....	18.10	20.25	17.75	18.50	17.40	15.30	15.50	16.50	14.63	12.00	8.40	12.75	11.00	11.13	15.25	20.55	17.15	16.20
Sept.....	21.75	21.00	18.00	18.60	17.50	15.80	15.88	16.50	15.00	12.00	9.50	12.00	11.00	11.50	16.30	20.62	17.25	18.38
Oct.....	22.50	19.60	17.50	18.50	17.13	15.50	16.50	16.50	15.00	12.00	9.75	11.85	10.65	12.30	16.60	19.13	16.75	22.25
Nov.....	20.50	17.75	17.88	18.50	16.60	15.50	16.50	15.75	14.38	12.00	9.31	10.75	10.37	12.50	16.50	16.50	16.75	21.50
Dec.....	20.00	19.50	19.20	18.50	16.50	15.50	16.50	15.50	14.00	11.50	8.50	11.00	11.30	12.90	16.75	16.25	16.75	20.42
Aver.....	18.13	22.18	18.80	18.16	17.22	15.67	15.78	16.29	14.74	12.48	9.17	10.26	11.62	11.66	14.95	19.22	16.03	17.79

Scrap Prices* at Chicago

No. 1 Heavy Melting Steel, Gross Ton

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$11.45	\$19.15	\$17.69	\$19.44	\$15.12	\$13.25	\$12.50	\$15.39	\$12.75	\$10.27	\$7.50	\$5.25	\$10.50	\$11.80	\$13.37	\$17.81	\$13.00	\$13.87
Feb.....	11.38	20.33	17.88	17.69	13.88	13.00	12.69	15.88	13.31	10.06	7.25	5.25	11.00	11.25	14.19	19.25	12.69	13.94
March.....	12.38	23.50	16.56	16.45	13.95	12.90	12.63	15.66	13.19	10.00	7.25	5.25	12.13	10.50	14.75	20.60	12.15	14.25
April.....	13.75	22.50	14.10	14.81	13.19	13.13	12.63	15.95	13.00	9.81	7.14	6.00	11.75	9.85	14.34	20.56	11.37	13.37
May.....	14.95	19.70	13.75	15.00	12.13	12.35	12.95	15.39	12.50	8.88	6.45	8.45	11.05	10.06	12.87	17.12	11.00	12.75
June.....	14.56	17.88	13.63	15.75	12.45	12.00	12.63	14.94	12.06	8.75	5.69	8.91	9.75	9.97	12.85	15.70	10.45	13.45
July.....	15.25	17.05	14.90	15.60	14.19	12.06	12.30	14.75	12.00	8.75	4.88	10.42	9.55	10.35	13.37	17.62	12.00	13.50
Aug.....	15.95	16.00	15.50	16.44	14.00	12.30	12.75	15.06	12.13	8.38	5.75	10.46	9.19	12.38	15.19	19.70	13.75	13.87
Sept.....	18.13	16.31	16.40	16.35	14.00	12.25	12.94	15.13	12.50	8.20	6.25	9.84	8.50	12.50	16.15	17.56	13.50	16.22
Oct.....	18.40	14.15	16.13	16.00	13.00	11.69	13.95	14.30	11.38	8.00	6.00	9.47	8.75	12.50	16.25	14.69	12.88	19.16
Nov.....	17.31	14.00	17.13	16.00	13.00	11.50	14.50	13.15	10.13	8.00	5.93	8.60	9.25	13.00	16.50	12.50	14.20	17.85
Dec.....	17.25	16.06	18.95	15.75	13.00	12.06	14.55	12.50	10.00	7.80	5.25	8.94	10.50	13.25	17.00	12.38	13.75	16.67
Aver.....	15.06	18.05	16.05	16.27	13.49	12.39	13.09	14.84	12.08	8.91	6.28	8.07	10.16	11.45	14.74	17.12	12.58	14.91

Steel Rerolling Rails, Gross Ton

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$12.10	\$20.40	\$18.88	\$21.75	\$17.50	\$16.38	\$14.90	\$17.00	\$14.63	\$12.50	\$10.50	\$7.50	\$11.30	\$12.60	\$14.12	\$19.50	\$15.50	\$17.25
Feb.....	12.00	21.75	20.13	19.25	16.63	15.94	15.00	17.50	15.00	12.00	10.50	7.50	11.81	12.50	15.19	21.00	15.50	17.06
March.....	13.31	24.63	19.13	17.86	16.50	15.60	14.44	17.50	15.00	12.00	9.85	7.50	12.62	11.88	15.50	22.30	15.40	17.20
April.....	14.50	23.75	16.30	16.00	16.13	16.00	13.81	17.50	15.00	11.75	9.00	7.88	12.50	11.30	15.19	23.12	14.63	17.00
May.....	15.70	21.70	15.00	16.88	15.19	15.20	14.40	17.50	14.81	10.69	8.30	9.30	11.90	11.00	14.31	21.62	14.25	16.75
June.....	15.25	19.25	14.81	17.85	15.45	14.75	14.81	17.50	14.63	8.40	7.31	9.63	10.50	10.62	14.00	19.40	13.70	18.15
July.....	16.13	18.00	15.50	17.44	17.19	14.88	14.75	17.50	14.50	10.39	6.63	11.32	10.35	11.30	14.37	20.75	15.13	18.25
Aug.....	16.90	17.50	16.19	19.00	17.10	15.30	15.13	17.75	14.50	10.13	6.75	12.00	10.00	13.12	15.69	21.75	18.15	18.25
Sept.....	19.38	17.38	17.30	19.25	17.39	15.19	15.88	17.81	14.40	10.00	7.19	11.38	10.00	13.50	16.50	20.56	18.00	20.50
Oct.....	20.30	15.80	17.06	18.88	16.63	14.88	16.50	17.20	13.88	10.00	8.00	10.88	10.00	13.50	17.00	17.19	17.25	22.25
Nov.....	18.38	15.06	18.19	19.44	16.50	14.50	16.63	15.50	12.50	10.25	8.00	9.90	10.06	13.75	17.00	15.05	17.50	20.65
Dec.....	17.75	17.00	20.36	19.10	16.19	14.63	16.60	14.60	12.50	10.50	7.50	10.00	10.95	13.80	17.25	15.13	17.38	19.75
Aver.....	15.98	19.35	17.40	18.56	16.53	15.27	15.24	17.07	14.28	10.72	8.29	9.57	11.00	12.41	15.51	19.78	16.03	18.59

Cast Iron Borings, Gross Ton

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$6.38	\$15.57	\$13.58	\$15.56	\$13.39	\$10.06	\$10.40	\$12.50	\$9.56	\$5.06	\$3.38	\$3.00	\$6.30	\$6.80	\$6.00	\$10.00	\$6.56	\$5.50
Feb.....	6.93	16.59	15.55	14.63	12.06	10.13	10.13	12.00	10.13	4.75	4.25	3.19	6.56	7.00	6.75	10.87	6.31	5.50
March.....	8.05	18.91	14.38	13.85	11.75	10.20	9.63	10.63	9.56	4.75	4.25	3.25	7.44	5.94	7.50	12.20	5.65	5.70
April.....	9.24	17.92	11.40	10.94	10.94	10.44	9.31	10.40	9.25	4.50	3.75	3.88	7.25	5.20	7.00	12.37	4.38	5.62
May.....	10.98	16.24	10.00	10.00	9.75	10.00	9.25	10.19	8.81	3.75	3.25	5.00	6.45	5.00	6.12	10.75	4.00	6.00
June.....	11.63	14.43	10.06	10.70	9.95	9.56	9.00	9.88	8.00	3.75	2.63	5.25	5.00	5.00	6.00	10.00	3.85	6.75
July.....	12.67	13.66	10.45	11.13	11.19	9.94	9.05	7.90	7.90	3.75	2.00	6.25	4.90	5.30	6.12	11.25	5.25	6.75
Aug.....	12.88	12.04	10.69	12.75	11.45	10.50	9.31	10.19	7.75	3.94	3.05	6.50	5.00	6.37	7.62	12.15	7.15	6.75
Sept.....	14.43	12.19	11.80	13.15	11.19	10.75	9.75	10.50	7.35	4.10	3.88	6.25	4.88	6.00	9.00	10.75	6.63	9.00
Oct.....	14.90	10.42	11.56	12.75	8.88	10.13	10.75	10.00	5.75	4.00	3.88	5.88	4.50	6.00	9.25	9.69	5.75	11.75
Nov.....	14.56	10.08	12.63	13.19	9.20	9.60	11.69	9.25	4.13	4.00	3.65	5.15	4.81	6.25	9.50	7.85	5.70	10.45
Dec.....	14.56	12.04	14.36	13.50	9.50	10.19	11.85	9.15	4.90	3.60	3.06	5.50	6.00	6.10	9.50	7.50	5.50	9.25
Aver.....	11.43	14.17	12.21	12.68	10.77	10.13	10.01	10.37	7.76	4.16	3.41	4.93	5.75	5.91	7.53	10.45	5.66	74.18

Cast Iron Carwheels, Gross Ton

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$15.30	\$26.70	\$20.50	\$21.38	\$18.00	\$15.31	\$13.90	\$14.13	\$13.81	\$11.00	\$8.19	\$7.55	\$10.70	\$11.90	\$13.19	\$18.25	\$15.50	\$12.50
Feb.....	15.00	27.25	21.00	19.38	17.13	15.13	14.00	14.50	14.69	10.50	7.50	7.88	11.44	12.00	13.12	18.81	14.88	12.50
March.....	16.50	28.38	21.00	17.10	17.00	15.00	13.88	14.50	14.69	10.10	6.95	7.00	12.00	10.89	14.00	20.40	13.90	12.90
April.....	18.63	27.75	16.70	16.00	16.39	15.00	13.50	14.50	14.45	9.50	7.00	8.06	11.75	10.50	14.00	21.25	13.13	12.75
May.....	18.50	24.10	16.25	16.06	15.25	14.05	13.45	14.50	13.88	9.13	6.40	9.10	11.15	10.50	13.75	19.37	12.75	12.50
June.....	18.25	21.88	15.63	17.30	15.30	13.50	13.06	14.39	13.55	10.00	5.69	9.50	9.75	10.50	13.50	18.20	12.20	12.75
July.....	19.25	20.60	16.40	17.12	16.39	13.75	12.80	14.00	13.50	10.00	5.50	10.00	9.55	10.85	13.62	18.87	13.38	12.75
Aug.....	20.60	19.50	17.13	17.50	15.90	14.50	12.75	14.00	13.50	9.75	6.30	10.50	9.50	12.75	15.00	19.75	14.55	12.75
Sept.....	23.75	19.75	18.20	17.70	15.25	14.25	13.31	14.00	13.50	9.50	7.00	10.25	9.50	12.75	16.00	18.75	14.00	15.00
Oct.....	25.10	17.90	17.63	17.38	14.50	13.56	13.85	14.00	13.13	9.30	7.00	9.88	9.50	12.75	16.50	16.94	13.25	17.94
Nov.....	24.63	17.88	18.63	18.31	14.50	13.25	14.25	13.88	12.13	8.75	7.00	9.20	10.00	13.00	16.50	14.95	13.10	17.05
Dec.....	24.00	19.75	20.70	18.30	14.50	13.44	14.10	13.60	11.75	8.50	7.00	9.50	11.00	13.25	17.50	15.13	12.50	16.00
Aver.....	19.96	22.62	18.31	17.79	15.84	14.23	13.57	14.17	13.55	9.67	6.79	9.04	10.49	11.80	14.72	18.39	13.59	139.49

Railroad Malleable Scrap, Gross Ton

	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Jan.....	\$16.39	\$12.75	\$7.00	\$5.50	\$11.10	\$13.70	\$15.94	\$20.12	\$15.00	\$15.06
Feb.....	17.13	11.94	7.00	5.50	11.75	12.75	16.87	20.87	14.37	15.25
March.....	16.88	11.70	6.65	5.63	12.25	13.06	18.00	22.45	13.40	15.95
April.....	16.55	11.13	6.38	6.75	12.00	12.80	17.12	21.69	12.63	15.25
May.....	15.75	10.25	6.00	9.35	11.30	13.00	15.75	19.50	12.25	14.75
June.....	13.94	9.55	5.19	9.75	9.75	12.50	15.50	19.20	11.70	15.15
July.....	13.50	9.00	4.63	10.25	9.55	12.35	15.62	20.25	13.00	15.25
Aug.....	13.50	8.43	5.10	10.50	9.38	14.50	17.25	20.75	15.90	15.25
Sept.....	13.50	7.50	6.75	9.75	8.75	14.75	18.10	18.75	15.13	17.50
Oct.....	13.13	7.40	6.38	9.38	9.00	14.65	18.50	15.93	14.25	21.87
Nov.....	12.69	7.25	5.50	8.70	9.13	15.31	18.12	14.15	15.10	20.65
Dec.....	12.25	7.00	5.50	9.75	11.20	15.75	19.00	14.75	15.00	19.25



JOHN H. VAN DEVENTER

New Executive Officers of The Iron Age



CHARLES S. BAUR

JOHN H. VAN DEVENTER, who has been editor-in-chief of The Iron Age for the past eight years, has been elected president of The Iron Age Publishing Co. and vice-president of the Chilton Co. of New York and Philadelphia, of which the former company is a subsidiary. Mr. Van Deventer succeeds Fritz J. Frank, who died Dec. 8.

CHARLES S. BAUR, general advertising manager of The Iron Age for many years, has been elected vice-president and general manager of The Iron Age Publishing Co. and also vice-president of the Chilton Co. Mr. Baur has been with The Iron Age for the past 37 years and is one of the best known men in the industrial advertising world.

Committee Continues Welding Research

A \$110,000 program of welding research will be carried out in 1940 by the Welding Research Committee of the Engineering Foundation, research organization of the national engineering societies.

More than 70 individual projects now in progress in universities and research laboratories throughout the nation will be continued, according to William Spraragen, technical secretary of the committee, which coordinates the research in cooperation with leading scientists in the field.

Studies in the weldability of steels, weld stresses, structural welding, and progressive failure in steels under repeated stresses will be emphasized. Research sponsored by the committee, Mr. Spraragen pointed out, aims to assist the steel industry by creating new markets for the use of steel.

Of the 47 reports issued by the committee last year 17 were related to fundamental research investigations, while seven resulted from the activities of the industrial research division, and 12 were critical digests of the world's

literature on welding. The reports represent the effort of 250 research workers, engineers and scientists. Close contact has been maintained with 70 universities.

Dr. Comfort A. Adams, E. G. Budd Mfg. Co., Philadelphia, former dean of the Harvard Engineering School, is chairman of the committee. The vice-chairman is H. C. Boardman, director of research, Chicago Bridge & Iron Co. The other members are: Everett Chapman, president, Lukens Weld, Inc.; J. H. Critchett, vice-president, Union Carbide & Carbon Research Laboratories; J. J. Crowe, engineer-in-charge of apparatus research and development, Air Reduction Sales Co.; Arthur S. Douglass, construction engineer, Detroit Edison Co.; C. L. Eksergian, chief engineer, Budd Wheel Co., Detroit; A. J. Ely, mechanical engineer, Standard Oil Development Co.; and F. H. Frankland, chief engineer, American Institute of Steel Construction, Inc.

Also, H. M. Hobart, consulting engineer, General Electric Co.; D. S. Jacobus, advisory engineer, Babcock & Wilcox Co.; G. F. Jenks, Colonel, Ordnance Department, U.S.A.; P. G.

Lang, Jr., engineer of bridges, Baltimore & Ohio Railroad; Arthur E. Pew, vice-president, Sun Oil Co., and R. E. Zimmerman, vice-president, United States Steel Corp. of Delaware.

Otis Steel Co. Publishes Illustrated Book of Plant

HIGHLIGHTS of the Otis Steel Co., Cleveland, are presented in a large book of photographs just published, together with a short history of the company.

Only outstanding views of the company's two plants, its equipment and operations are displayed, enough to give the reader a thorough understanding of production from ore handling to the finishing departments. Captions are concise and plenty of space is provided between the pictures in the 36-page book, which is now being circulated to the trade.

The photography is by Ernest Graham and includes views of the Riverside and Lakeside Works at Cleveland, blast furnaces, basic open hearths, the 77-in. continuous hot strip mill, production of plates, etc.

THIS WEEK IN WASHINGTON

*... TNEC likely to resume steel hearings on Jan. 22 ...
Arnold asks aid in handling 600 anti-trust law complaints
... Ickes sees aluminum deal justifying New Deal power projects.*

By L. W. MOFFETT
The Iron Age

WASHINGTON—If agreeable to steel interests, the Temporary National Economic Committee may resume its steel inquiry on Jan. 22. The hearing will last not longer than a week, committee representatives said, and will be conducted jointly by the Department of Justice and the Federal Trade Commission. It will deal with costs and the basing point system, the department to handle the former and the FTC the latter subject. Meanwhile the Department of Justice is completing compilations on prices and distribution which will be introduced at the proceeding.

The material on costs and the basing point system in the steel industry represents the most elaborate studies of the kind ever made. It was prepared by the United States Steel Corp. at a cost which is said to have run into hundreds of thousands of dollars. The survey was made under the direction of Theodore O. Yntema, professor of statistics at the University of Chicago. At the conclusion of his testimony in October during the Department of Justice steel price policy hearings before the TNEC, Benjamin F. Fairless, president of the steel corporation offered to introduce this survey, but at the suggestion of A. F. Feller, department attorney, it was withheld as evidence and was turned over to the department and the FTC in order that they might examine it. The department has gone over all the sections except those dealing with the basing point system which have been reviewed by the FTC. The study on this method of quoting prices is designed as an answer to the bitter attack made by the FTC on the system at the TNEC steel inquiry which the Commission directed last March. Figures on costs at its Eastern and Pacific Coast plants, requested by Mr. Feller, also are expected to be submitted by the Bethlehem Steel Corp. but at present it is planned to call only United Steel Corp.

representatives as witnesses at the hearing.

FTC's Mind Made Up

Inasmuch as the commission has a closed mind on the subject and has been long on record in urging elimination of the basing point system it is not expected that any amount of evidence, either by quality or quantity, would cause it to change its position. It hardly could do so without reversing one of its most fundamental policies. Likewise to do so would mean the dropping of basing point cases still pending. Not only may it be expected to press these cases without abatement but it is quite conceivable that the study presented from the point of the steel industry will inspire it, if it runs true to form, to renew its attack on the system when the steel inquiry is resumed. The chief service of the study therefore probably lies in the hope that it will be fairly reviewed by the TNEC as a whole rather than being passed upon merely by the biased FTC which already has acted as prosecutor, judge and jury and denounced the basing point system as setting up a monopolistic practice which suppresses competition.

It is doubted that the FTC will heed the testimony at the Department of Justice steel hearing clearly showing that the industry is competitive, that prices are not rigid, that they are not fixed by consultations within the industry, that they are not established at fictitiously high levels or that charges for extras are not a price increasing device.

At least as a matter of policy if not of belief, the commission attributes nothing of a competitive nature to the steel industry and is even more hostile to it than some of the notable New Deal big business baiters. Some of the latter, after listening to steel executives, admitted they were impressed with their testimony and conceded it

convinced them that sharp competition exists in the steel industry during periods of a "lagging market." Leon Henderson, "economic coordinator" of the TNEC, reflecting the view of inside New Deal economists, insists there is no competition in the steel industry in the "classical or market sense," but that there is "monopolistic competition" in the industry.

The Department of Justice economic unit's compilations on prices and distribution will be sent to executives in the steel industry for examination and any comment they care to make on them before they are introduced before the TNEC. There will be two detailed summaries, now nearing completion, covering prices and distribution of structural shapes, plates, hot rolled strips and hot rolled sheets, for February, 1939, together with figures on distribution for the years 1936-37-38. These compilations will be given out in two advance releases. The first release will deal with plates and shapes and will be followed closely by a release on hot strips and hot sheets. It was stated that because of shortage of personnel, the department will not be able to prepare detailed compilations on six other steel products covered in the two questionnaires which were sent to the industry. There will be, however, general summaries on them. These products are sheet and tin plate bars, cold rolled sheets, cold rolled strips, tin plate, wire rods and plain wire. The questionnaires were sent to 54 companies, representing 90 per cent of the nation's ingot capacity.

Two Progress Reports

The TNEC likely will make two "progress" reports during the present session of Congress to the President and to Congress. The first, expected to be made soon, will be on its price study. The other, dealing with general economics and financial studies, probably will be made in March. The final report, with recommendations, will be made in January, 1941, when under the resolution setting it up, the TNEC will expire, unless more funds are appropriated for its continuation. That additional money will be asked for is taken as a foregone conclusion since both Senator Joseph C. O'Mahoney, Democrat of Wyoming, TNEC chairman, and Assistant Attorney General Thurman W. Arnold already have suggested that the committee be made permanent as a "price watch-



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dog." Whether Congress will grant additional appropriations is debatable. Unless the committee gets more money it is said it will have to close its inquiries not later than June of the present year.

Final recommendations of the committee are expected to suggest tightening of the anti-trust laws as proposed by Mr. Arnold, while Senator O'Mahoney is confidently expected to insist that they urge enactment of his Federal licensing bill. Already the committee recommended at the previous session of Congress that the patent laws be revised.

In steel and other basic industries, New Deal economists, such as Mr. Henderson, declare that the anti-trust laws must be streamlined to give "a new concept of competition" to prevent such industries from becoming monopolies. As a further part of their program of "planned economy" they think that the government, probably through the Department of Commerce, should "aid" the steel and other industries in stabilizing production by obtaining information on demands of such important steel users as automobile manufacturers, and on trends of both domestic and foreign production and demand.

Mr. Henderson told *THE IRON AGE* that while no conclusions had been reached these are among suggestions that are under consideration. There is a difference of opinion in administration circles on the desirability of authorizing the Department of Justice to give administrative declaratory rulings, advising corporations in advance whether or not contemplated discussion with competitors is illegal. Some New Deal economists favor the proposal. But it is likely it will get scant, if any consideration, since it is opposed by Mr. Arnold, who has said that "thinking you can govern a country by definition . . . is the essence of bureaucracy."

In making a distinction between "classical" and "monopolistic competition," Mr. Henderson said that in the former, prices such as in agricultural products may be changed without affecting the entire industry. "Monopolistic competition" was held to be peculiar to large industries, such as steel and oil, where price changes cannot be made without affecting the entire industry. There is, Mr. Henderson said, no "equating of supply and demand," though he conceded that there is competition.

He maintains that there is no sense making believe that free competition can be enforced in industries where practices have grown up which make

such an accomplishment impossible within the framework of existing anti-trust laws.

"What we need to do is to recognize the situations as they actually exist and deal with these industrial problems on a realistic basis," said Mr. Henderson.

Arnold Asks More Help in Handling Anti-Trust Complaints

WASHINGTON—Despite the 50 per cent personnel increase in the staff of the Justice Department's anti-trust division last year, Assistant Attorney General Thurman Arnold reported to Congress yesterday that additional help is still needed before his division can "fully discharge its responsibility under the law" by proceeding with more than 600 pending complaints.

The country's No. 1 trust buster, who noted that 200 investigations of major importance are being made, told Congress in his report that there is more interest today in the Sherman Anti-trust Act than at any other time during its 50 years of existence, and that as a result of the department's policy of prosecuting past violations by indictment there is new respect for the anti-trust laws and business men feel that the department can give them "real protection."

Tears for Consumer

While no mention was made of "identical bids" being received by various departments of the government—a complaint which the department usually inserts in its annual reports—Mr. Arnold shed a few tears on behalf of the independent business man, the consumer, and in the "medium metropolis whose industries are beginning to feel the effects of absentee ownership." To illustrate his point that present industrial growth reflects "definite trends toward concentration of control and consequent stagnation of competitive activity," the Assistant Attorney General told Congress that three companies produce more than 60 per cent of the steel supply, three companies produce 85 per cent of the automobiles, four companies produce 78 per cent of the copper, four companies produce 64 per cent of the iron ore, one company produces 100 per cent of the aluminum, and three companies produce 90 per cent of the tin cans.

Outlining the department's procedure in using civil and criminal prosecutions concurrently, and attempting to

What weight may be given the views and recommendations of New Dealers, if the recommendations find their way in the reports of the TNEC, will probably depend largely on the outcome of the Presidential election of the current year.

clarify its attitude with respect to the anti-trust laws, Mr. Arnold insisted he is putting emphasis on restraints of trade rather than on "trust busting." Although he denied that he plans to break up large industrial units he said that "the rule of reason in the anti-trust laws" aims at "eliminating those (organizations) which are blocking the production and distribution of goods."

Consent Decrees

On the subject of consent decrees, Mr. Arnold wrote that his department will not compromise criminal cases on the mere promise to reform but that where it appears that the consent decree will yield more constructive results for consumers, employees, and competitors, will such a decree be entertained. Mr. Arnold added:

"This procedure has been followed consistently. It has been successful. In practically all pending cases, business firms are conferring either with the Department of Justice or with representatives of the Department of Commerce in an attempt to find a voluntary solution. In many anti-trust actions two subjects are sought. The first is the cessation of the illegal practices so that obstacles to a free market may be removed. The second is the substitution of new techniques and mechanisms for distribution to replace those activities which are illegal.

"The attainment of this second object sometimes involves the acceptance of new arrangements between competitors, and of course there are often differences of opinion between the department and particular business men as to what working arrangement for distribution of goods are reasonable in lieu of the illegal activities which are to be discontinued. NRA codes are not permitted under the present law, but some kind of a constructive solution of the problems of distribution is often necessary. The fact that a conference is held, even where decrees are not agreed upon, creates a better understanding on the part of the department and the business men involved."

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A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	Jan. 2, 1940	Dec. 26, 1939	Dec. 5, 1939	Jan. 3, *1939
Rails, heavy, at mill	\$40.00	\$40.00	\$40.00	\$40.00
Light rails: Pittsburgh, Chi- cago, Birmingham	40.00	40.00	40.00	40.00
Rerolling billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Bir- mingham, Sparrows Point	34.00	34.00	34.00	34.00
Sheet bars: Pittsburgh, Chi- cago, Cleveland, Youngs- town, Buffalo, Canton, Sparrows Point	34.00	34.00	34.00	34.00
Slabs: Pittsburgh, Chicago, Gary, Cleveland, Youngs- town, Buffalo, Birmingham, Sparrows Point	34.00	34.00	34.00	34.00
Forging billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Bir- mingham	40.00	40.00	40.00	40.00
Wire rods: No. 5 to 9/32 in., Pittsburgh, Chicago, Cleve- land, per lb.	2.00	2.00	2.00	1.92
Skelp, grvd. steel: Pittsburgh, Chicago, Youngstown, Coatesville, Sparrows Point, cents per lb.	1.90	1.90	1.90	1.90

Finished Steel

Cents Per Lb.:	Jan. 2, 1940	Dec. 26, 1939	Dec. 5, 1939	Jan. 3, *1939
Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham	2.15	2.15	2.15	2.25
Plates: Pittsburgh, Chicago, Gary, Birmingham, Spar- rows Point, Cleveland, Youngstown, Coatesville, Claymont	2.10	2.10	2.10	2.10
Structural shapes: Pittsburgh, Chicago, Gary, Buffalo, Bethlehem, Birmingham	2.10	2.10	2.10	2.10
Alloy bars: Pittsburgh, Buf- falo, Bethlehem, Massillon or Canton	2.70	2.70	2.70	2.80
Cold finished bars: Pitts- burgh, Buffalo, Cleveland, Chicago, Gary	2.65	2.65	2.65	2.70
Hot rolled strip: Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown, Birmingham	2.10	2.10	2.10	2.15
Cold rolled strip: Pittsburgh, Cleveland, Youngstown	2.80	2.80	2.80	2.95
Sheets, galv., No. 24: Pitts- burgh, Gary, Sparrows Point, Buffalo, Middletown, Youngstown, Birmingham	3.50	3.50	3.50	3.50
Hot rolled sheets: Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown	2.10	2.10	2.10	2.15
Cold rolled sheets: Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown	3.05	3.05	3.05	3.20

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Cents Per Lb.:	Jan. 2, 1940	Dec. 26, 1939	Dec. 5, 1939	Jan. 3, *1939
Wire nails: Pittsburgh, Chi- cago, Cleveland, Birming- ham	2.55	2.55	2.55	2.45
Plain wire: Pittsburgh, Chi- cago, Cleveland, Birming- ham	2.60	2.60	2.60	2.60
Barbed wire, galv.: Pitts- burgh, Chicago, Cleveland, Birmingham	†3.40	3.40	3.40	3.20
Tin plate, 100 lb. base box: Pittsburgh and Gary	\$5.00	\$5.00	\$5.00	\$5.00

*Pittsburgh prices only.
†Applies to 80-rod spools only.

Pig Iron

Per Gross Ton:	Jan. 2, 1940	Dec. 26, 1939	Dec. 5, 1939	Jan. 3, *1939
No. 2 fdy., Philadelphia	\$24.84	\$24.84	\$24.84	\$22.84
No. 2, Valley furnace	23.00	23.00	23.00	21.00
No. 2, Southern Cin'ti	23.06	23.06	23.06	21.06
No. 2, Birmingham	19.38	19.38	19.38	17.38
No. 2, foundry, Chicago†	23.00	23.00	23.00	21.00
Basic, del'd eastern Pa.	24.34	24.34	24.34	22.34
Basic, Valley furnace	22.50	22.50	22.50	20.50
Malleable, Chicago†	23.00	23.00	23.00	21.00
Malleable, Valley	23.00	23.00	23.00	21.00
L. S. charcoal, Chicago	30.34	30.34	30.34	28.34
Ferromanganese, seab'd car- lots	100.00	100.00	100.00	92.50

†The switching charge for delivery to foundries in the Chi-
cago district is 60c. per ton.

Scrap

Per Gross Ton:	Jan. 2, 1940	Dec. 26, 1939	Dec. 5, 1939	Jan. 3, *1939
Heavy melting steel, P'gh...	\$18.25	\$18.25	\$18.75	\$15.75
Heavy melting steel, Phila...	18.50	18.50	19.25	15.25
Heavy melting steel, Ch'go...	16.25	16.25	16.75	13.75
Carwheels, Chicago	15.75	15.75	16.00	12.50
Carwheels, Philadelphia	20.25	20.25	20.75	16.75
No. 1 cast, Pittsburgh	19.25	19.25	19.75	15.50
No. 1 cast, Philadelphia	20.25	20.75	20.75	16.75
No. 1 cast, Ch'go (net ton)	14.25	14.25	14.50	12.50

Coke, Connellsville

Per Net Ton at Oven:	Jan. 2, 1940	Dec. 26, 1939	Dec. 5, 1939	Jan. 3, *1939
Furnace coke, prompt	\$4.50	\$5.00	\$5.00	\$3.75
Foundry coke, prompt	5.50	5.75	5.75	4.75

Non-Ferrous Metals

Cents per Lb. to Large Buyers:	Jan. 2, 1940	Dec. 26, 1939	Dec. 5, 1939	Jan. 3, *1939
Copper, Electrolytic, Conn...	12.50	12.50	12.50	11.25
Copper, Lake, New York...	12.50	12.50	12.50	11.375
Tin (Straits), New York...	48.75	50.25	52.00	46.50
Zinc, East St. Louis	5.75	6.00	6.00	4.50
Zinc, New York	6.14	6.39	6.39	4.89
Lead, St. Louis	5.35	5.35	5.35	4.70
Lead, New York	5.50	5.50	5.50	4.85
Antimony (Asiatic), N. Y...	16.50	16.50	16.50	14.00

The Iron Age Composite Prices

Finished Steel

Jan. 2, 1940	2.261c. a Lb.
One week ago	2.261
One month ago	2.261
One year ago	2.286

Based on steel bars, beams,
tank plates, wire, rails, black
pipe, sheets and hot-rolled strip.
These products represent 85 per
cent of the United States output.

	HIGH	LOW
1939.....	2.286c., Jan. 3	2.236c., May 16
1938.....	2.512c., May 17	2.211c., Oct. 18
1937.....	2.512c., Mar. 9	2.249c., Jan. 4
1936.....	2.249c., Dec. 28	2.016c., Mar. 10
1935.....	2.062c., Oct. 1	2.056c., Jan. 8
1934.....	2.118c., Apr. 24	1.945c., Jan. 2
1933.....	1.953c., Oct. 3	1.792c., May 2
1932.....	1.915c., Sept. 6	1.870c., Mar. 15
1931.....	1.981c., Jan. 13	1.883c., Dec. 29
1930.....	2.192c., Jan. 7	1.962c., Dec. 9
1929.....	2.236c., May 28	2.192c., Oct. 29
1928.....	2.192c., Dec. 11	2.131c., Jan. 3

Pig Iron

\$22.61 a Gross Ton
22.61
22.61
20.61

Based on average for basic
iron at Valley furnace and found-
ry iron at Chicago, Philadel-
phia, Buffalo, Valley and South-
ern iron at Cincinnati.

HIGH	LOW
\$22.61, Sept. 19	\$20.61, Sept. 12
23.25, June 21	19.61, July 6
23.25, Mar. 9	20.25, Feb. 16
19.73, Nov. 24	18.73, Aug. 11
18.84, Nov. 5	17.83, May 14
17.90, May 1	16.90, Jan. 27
16.90, Dec. 5	13.56, Jan. 3
14.81, Jan. 5	13.56, Dec. 6
15.90, Jan. 6	14.79, Dec. 15
18.21, Jan. 7	15.90, Dec. 16
18.71, May 14	18.21, Dec. 17
18.59, Nov. 27	17.04, July 24

Steel Scrap

\$17.67 a Gross Ton
17.67
18.25
14.92

Based on No. 1 heavy melting
steel quotations at Pittsburgh,
Philadelphia and Chicago.

HIGH	LOW
\$22.50, Oct. 3	\$14.08, May 16
15.00, Nov. 22	11.00, June 7
21.92, Mar. 30	12.92, Nov. 10
17.75, Dec. 21	12.67, June 9
13.42, Dec. 10	10.33, Apr. 29
13.00, Mar. 13	9.50, Sept. 25
12.25, Aug. 8	6.75, Jan. 3
8.50, Jan. 12	6.43, July 5
11.33, Jan. 6	8.50, Dec. 29
15.00, Feb. 18	11.25, Dec. 9
17.58, Jan. 29	14.08, Dec. 3
16.50, Dec. 31	13.08, July 9

... SUMMARY OF THE WEEK ...

... 1940 starts out under most auspicious circumstances since 1929.

• • •

... Steel operations rebound this week to 86 per cent, slightly below pre-holiday week.

• • •

... Automobile and railroad requirements take first rank in steel backlogs.

THE new year and the new decade start out under more auspicious circumstances for the steel industry and some of its principal consuming outlets than any year since 1929, not excepting 1937, which was the best year for the steel industry in the 1930-1939 decade.

While the steel industry and the automobile industry have left record-breaking production records behind them in the fourth quarter of 1939, the outlook for these major units of industry and some of their collateral lines is reasonably promising for at least the first half of 1940, beyond which the trend is not clear.

Although some of the indices of business activity were sharply lower in the final week of 1939, being reflected in a decline of 5.4 points in THE IRON AGE index of capital goods activity to 99.4, this figure was the highest for the final week of any year in the past decade, the nearest to it having been in 1936, when it was 98.4 at the year end. In the last week of 1938 this index was 75.6.

Steel production in the fourth quarter of 1939 was about 16,000,000 gross tons, the highest on record for any three-month period, while automobile output was about 1,163,000 units, which is slightly above the previous peak for the fourth quarter of a year established in 1926. Pig iron production is holding at a high level, additional furnaces having gone into blast during December.

Ingot production this week has rebounded from the low of 74 per cent in Christmas week to 86 per cent, only three and a half points below the estimated rate for the pre-holiday week and a point above the rate which THE IRON AGE predicted for this week.

A comparison of the district operating rates for the current week and the week before Christmas shows that three districts—Birmingham, Detroit and Southern Ohio—are higher this week than in the week ended Dec. 23, two are unchanged, while the others show moderate losses. The first figure is this week's rate and the second figure that of the pre-holiday week: Pittsburgh, 86-89; Chicago, 90.5-92; Youngstown, 83-88; Eastern Pennsylvania, 87-89; Cleveland-Lorain, 81-88; Buffalo, 68.5-85; Wheeling-Weirton, 81-81; Detroit, 100-95.5; Birmingham, 94-86; Southern Ohio, 76-42; St. Louis, 74-80; Eastern, 95-95.

Operations this month will be bolstered somewhat by the necessity faced by some steel companies for rebuilding badly depleted stocks of ingots and semi-finished steel.

A FAVORABLE indication is that the decline in prices of steel scrap over the past three months has apparently been checked. While there were still soft spots during the past week, these were offset by evidences of firmness in some districts. With the exception of the last week of October, when there was a slight upward move, THE IRON AGE steel scrap composite price has been reduced every week since the first week of October until this week when it remains at last week's figure of \$17.67. The decline from the fall peak of \$22.50 has amounted to \$4.83.

INCOMING steel business was naturally in reduced volume in the week between Christmas and New Year's day. Some companies report that sales in that period were equal to about 50 per cent of shipments, but in the case of one important producer sales were 80 per cent of shipments. The first quarter trend of new business is not expected to become apparent before the middle of January.

Late December business included railroad orders for repair work. So long as railroad carloadings and earnings continue on a favorable basis, the carriers probably will buy steel. New equipment orders are light, the only one of note being 100 lightweight sleeping cars to cost \$8,000,000 to be built by the Pullman-Standard Car Mfg. Co. for the Pullman Co. for use by the New York Central and Pennsylvania. Meanwhile, about a million tons of rails and track accessories will be rolled for the railroads during the first quarter, in addition to which about 250,000 tons of plates, sheets, bars, etc., will be required for cars that are to be built against orders placed last fall.

Substantial steel orders have also been placed by some of the automobile companies, mostly for flat-rolled steel, which has been booked at full market prices with the possible exception of a relatively small amount of single pickled annealed hot rolled sheets which were obtained at the price in effect prior to the recent \$2 a ton readjustment on hot rolled sheets. Even this minor soft spot involved only gages of 19 to 22, inclusive, and the irregularity was not general.

A reduction in tin plate operations accounts for some of the loss in ingot production as compared with mid-December. Tin plate production this week is estimated at 78 per cent, up 10 points from last week but down 10 points from the pre-holiday week. Some companies are taking out of operation old hot mill equipment which was rushed into service in September and October.

Lettings of fabricated structural steel were light in the past week, amounting only to 9000 tons, while reinforcing bar awards were 6350 tons.

Stocks of iron ore at furnaces and Lake Erie docks are likely to be subnormal on May 1, indicating that the 1940 movement will show a gain over the 45,000,000 tons brought down in 1939.

DETROIT—The end of the decade, the passing of the turbulent thirties, has been celebrated by the automobile industry in characteristic fashion.

Even without benefit of official statistics, it seems safe to say that the final quarter of 1939 saw the setting of an all-time record for production of automobiles in the last quarter of any year. Not until final government figures are released sometime hence will the accurate data be available, but

on the basis of weekly estimates of automobile production it is indicated that the last three months of the year just closed saw the assembly of a total of 1,162,990 passenger cars and trucks in the United States and Canada. This is an increase of 148,011, or 14.6 per

THIS WEEK ON THE

... All-time record for final set . . . Hugh L. Warner, shift, dies at

cent, over the previous year's 1,014,979 vehicles for the final quarter and is just a hair's breadth above the previous peak, established in 1926 at 1,154,806 units.

What would have been the total output for the last quarter had not the Chrysler strike upset all calculations is very difficult to say. Virtually all of the time when 1940 model production was below 90,000 a week Chrysler plants were strike-bound. If this repressive influence had been removed, production might have bounded up sharply in early October and added another 150,000 or more cars to the season's output.

Despite loss of a working day because of the Christmas holiday, the automobile industry last week maintained its production about 15 per cent above the corresponding period of 1938. Output was 89,365 units, compared with 75,215 in 1938 and 117,705 the week before the past Christmas, according to Ward's Automotive Reports. Decreases were quite consistent throughout the industry except for Packard and Willys-Overland, which were closed for inventory. General Motors completed 38,675 cars and trucks, compared with 48,968 in the previous week. Chrysler turned out 22,100, against 27,135 in the previous week; and Ford's total dropped from 25,800 to 20,660. For the Big Three, comparative figures follow: Chevrolet, 23,000, compared with 28,000 in the previous week; Ford, 20,000, contrasting with 25,000 in the week before Christmas, and Plymouth, 10,350, a decline from 12,950.

Hugh L. Warner Dead

Pioneers must pass from every field of endeavor. With increasing frequency Fate pauses to remind us that the great automobile industry is passing rapidly into the hands of newer generations. One of the most heroic of the pioneers in the automobile business passed from the scene on Wednesday, Dec. 27, when Hugh L.

1915 to 1940 at HOWELL

The Same Ideal for a Quarter Century — "PERFECTION"

... 1940—HOWELL'S Silver Anniversary Year!

And today, just as in 1915 when the first HOWELL Motor was wound, every operation of hand and machine is directed toward one ideal: "To produce the most nearly perfect electric motors."

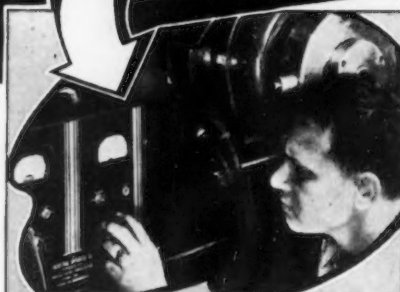
This desire to attain perfection still inspires everything done at HOWELL . . . the use of finest materials—unhurried craftsmanship—the most exacting of final tests.

Yes, the hard way to build motors—but what a boon to motor users!

Select HOWELL Motors, and you're certain of getting the last word in unflinching performance and low operating costs.

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Exacting Tests Such As These Insure that Every HOWELL Motor Measures Up



QUIETNESS TEST—conducted in sound-proof laboratory—motor operating at full speed. Every HOWELL Motor is quiet-running—we make sure of that.



PRECISION BALANCE TEST—vibrometer check-up with motor operating at full speed, assuring perfect balance of rotor assembly and bearings.



HOWELL ELECTRIC MOTORS COMPANY
HOWELL, MICHIGAN
Representatives In All Principal Cities

ASSEMBLY LINE

By W. F. SHERMAN
Detroit Editor

quarter production believed
pioneer of sliding gear
age of 72.

Warner died in his home at the age of 72.

Mr. Warner was the inventor of a sliding gear shift which he patented early in the century. As virtually everyone knows, this type of gear shift became the standard of the industry. He was the founder of Warner Gear Works in Muncie, Ind., which later became the Muncie Gear Works.

A draftsman in his youth, long hours over the drawing board contributed to the eventual failure of his eyesight 16 years ago. Warner became a part of the organization at Ford Motor Co. in August, 1916, when he was employed in the engineering department on special gears. His record of employment in that organization, according to an official, is a perfect one and includes long experience in the tool and die room.

Sixteen years ago his eyes failed him and he entered a world of darkness. His activities were curtailed by his blindness, but he refused to be halted or kept from work. Henry Ford responded by assigning him to special duties in the plant. He was told that he could have his job as long as he lived. His work was among other blind men who are kept busy at the Rouge plant at special tasks for which they are fitted. These men he encouraged, counselled, guided. Every morning for 16 years a driver took him to work and each afternoon he was driven home again. Two weeks ago a brain abscess developed and he did not rally.

Program For Handicapped

Ford Motor Co. has an unusual program for the physically handicapped which the Warner incident calls to mind. There are, in the Ford plant, currently nearly 10,000 employees with various physical shortcomings or handicaps—all of these men doing tasks within their scope and getting paid the standard daily rate for their job. This group of 10,000 includes

men with every type of handicap—from lost fingers, arms, legs, to lost eyesight and other serious results of accidents or illness. It has been said that the total Ford payroll, which at present covers approximately 86,500 employees at the Rouge plant, includes

in its total a proportional representation of every class and group in the American census. Thus the percentage of blind, crippled, and of each nationality is said to be approximately the same as the percentage of these groups in our population.



Coke Handling and Preparation Plant Designed and Built by Heyl & Patterson.

COKE HANDLING Comes to the Front

As steel production mounts, the continuous and efficient flow of essential materials becomes increasingly important. Furnaces long idle are now being blown in, many with auxiliary equipment in need of either extensive repairs or complete modernization.

In particular, producers are now considering the modernization of their coke handling and preparation plants, not only to provide increased capacity but, also, to assure improved products of greater marketability.

Whether a complete plant or merely additions or replacements to present equipment, Heyl & Patterson is equipped to render an unusually comprehensive service. With experience of more than 40 years in this field, completely coordinated engineering, shop and erection facilities, you can depend upon this organization to find the low-cost, resultful answer to your particular coke handling problem.

ORE BRIDGES
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UNLOADING TOWERS
PIG CASTING
MACHINES
COAL & COKE
HANDLING PLANTS

HEYL & PATTERSON INC.

50 WATER STREET

PITTSBURGH, PA.

REINFORCING STEEL

... Awards of 6350 tons; 1750 tons in new projects

ATLANTIC STATES AWARDS

- 200 Tons bars and mesh, New Haven, Conn., State road, to Truscon Steel Co., Boston; D. V. Friene & Co., New Haven, Conn., contractors.
- 178 Tons, Huntingdon County, Pa., Tuscarora Mountain Tunnel ventilation building, to Truscon Steel Co., Youngstown; Boyd H. Kline, contractor.
- 132 Tons, Dutchess County, N. Y., highway project R-4090, to Truscon Steel Co., Youngstown; John Arborio, contractor.

SOUTH AND CENTRAL

- 600 Tons, Enid, Okla., grain elevator, to Sheffield Steel Corp., Kansas City, Mo.
- 120 Tons, East Cleveland, Ohio, culvert for city, to Patterson-Leitch Co., Cleveland.
- 115 Tons, Cleveland, underpass retaining walls for city, to Patterson-Leitch Co., Cleveland.

WESTERN STATES

- 3000 Tons, LaVerne, Cal., water softening and filtration plant for Los Angeles Metropolitan Water District, to Soule Steel Co., Los Angeles, through Griffith Co., Los Angeles, contractor.
- 1300 Tons, Friant, Cal., Friant Dam (Bureau of Reclamation Invitation 48561-A), recommended to Colorado Fuel & Iron Corp., Denver.

CANAL ZONE

- 700 Tons, Panama Canal, schedule 3775, to Republic Steel Corp., Cleveland.

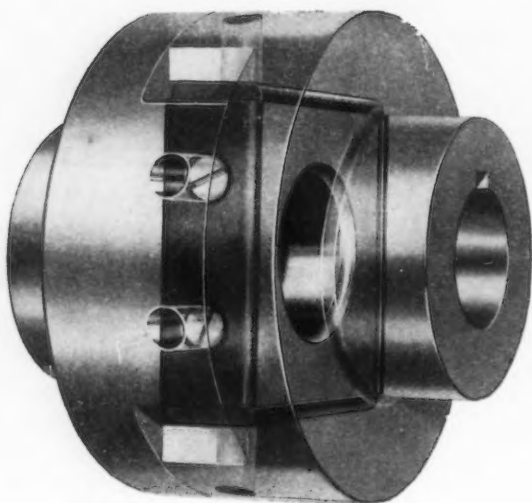
PENDING REINFORCING BAR PROJECTS ATLANTIC STATES

- 400 Tons, Holyoke, Mass., housing project.
- 110 Tons, Stonington, Conn., State bridge.

CENTRAL STATES

- 260 Tons, Detroit, Fox Creek sewer and seawall.
- 226 Tons, Licking County, Ohio, State project; Purdy Construction Co., Mansfield, Ohio, low bidder.
- 200 Tons, Milwaukee, Seaman Building Co. plant.
- 170 Tons, Toledo, Ohio, Ottawa Street State bridge; bids taken Dec. 30.
- 166 Tons, Hamilton County, Ohio, State project; Middle West Roads Co., Indianapolis, low bidder.
- 160 Tons, Gates Mills, Ohio, State project; Holmes Construction Co., Wooster, Ohio, general contractor.
- 141 Tons, Licking and Muskingum Counties, Ohio, State project; Ralph Myers & Co., Salem, Ind., low bidders.
- 135 Tons, Lucas County, Ohio, State project; A. Bentley & Sons, Toledo, low bidders.
- Unstated Tonnage, Chicago, Central Avenue viaduct over Milwaukee Road tracks; bids Jan. 17.

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- Has only 3 simple—rugged parts.
- Metallic center block which transmits load is free to float in any direction without cramping—binding—or usual friction and wear.
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- No flexible materials to absorb energy and cause side thrust.
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Inland Appeals SWOC Case After Witt Testimony

CHICAGO—The expected happened when Inland Steel Co. last week filed a motion with the United States Circuit Court of Appeals asking permission to submit a transcript of testimony before the special House committee investigating the National Labor Relations Board as a part of a petition to set aside an NLRB ruling directing the company to recognize the SWOC.

In his petition, Attorney Ernest S. Ballard said that the House committee testimony would show that Secretary Nathan Witt of the board conspired with the SWOC to bring about a controversy to involve Inland in a hearing before the board. Mr. Ballard also declared that the testimony would show that Trial Examiner Charles A. Wood had prejudged the case.

British Steel Plants Start Year at Capacity

LONDON, Jan. 2 (by Cable)—The year opens with British works operating at full time, a situation that is likely to continue. Prewar contracts are now no longer exempted from licenses, it being held that a reasonable time has now elapsed for the completion of such contracts.

Strong efforts are to be made this year to increase exports even at the expense of industrial users.

The Continent reports increasing activity. Belgian works are well filled with orders. Belgian sales offices are unable to release export tonnage owing to commitments of the Belgian Government. Holland tried to buy merchant bars up to 1950. The German Government is now declining to sell to Holland.

FABRICATED STEEL

NORTH ATLANTIC STATES AWARDS

- 340 Tons, Long Island City, N. Y., grandstand addition and administration building for Queens County Jockey Club, to Belmont Iron Works, Philadelphia.
330 Tons, Edgewater, N. J., building addition for Hills Bros. Coffee, Inc., to Bethlehem Steel Co., Bethlehem, Pa.
180 Tons, Elmwood, Conn., factory building for Wire Mold Co., to Berlin Construction Co., Berlin, Conn.
170 Tons, Laurel Hill, N. Y., tin plant for Phelps-Dodge Corp., to an unnamed fabricator.
170 Tons, Marcus Hook, Pa., case structure for Sun Oil Co., to F. M. Weaver & Co., Lansdale, Pa.
130 Tons, Garfield, N. J., building for Heyden Chemical Corp., to F. M. Weaver & Co., Lansdale, Pa.

CENTRAL STATES

- 850 Tons, Wasta, S. D., Cheyenne River State bridge, to Pittsburgh Des Moines Steel Co., Pittsburgh.
578 Tons, Muscatine, Iowa, State bridge, to American Bridge Co., Pittsburgh.
550 Tons, Spaulding, Ill., State bridge, to Illinois Steel Bridge Co., Jacksonville, Ill.
430 Tons, Jackson County, Mo., bridge, to Kansas City Structural Steel Co., Kansas City, Kan.
375 Tons, Peoria, Ill., alcohol unit, to Joseph T. Ryerson & Son, Inc., Chicago.
350 Tons, Milwaukee, plant addition, Kearney & Trecker Corp., to Worden-Allen Co., Milwaukee.
330 Tons, Bay City, Mich., S. S. Kresge Co., store, to Whitehead & Kales Co., Detroit.
280 Tons, St. Bernard, Ohio, building for Cincinnati Chemical Works, to Bethlehem Steel Co., Bethlehem, Pa.
227 Tons, Ripley, Ohio, State bridge, to Fort Pitt Bridge Works Co., Massillon, Ohio.
205 Tons, Kemball, Neb., bridge FAGM 16-A (3) to American Bridge Co., Pittsburgh.
165 Tons, Grabill, Ind., bridge, to Midland Structural Steel Co., Cicero, Ill.
180 Tons, Monticello, Ill., State bridge, to Bethlehem Steel Co., Bethlehem, Pa.
145 Tons, Council Bluffs, Iowa, Chicago & North Western Railroad shop to Gates City Iron Works, Chicago.
140 Tons, Jackson County, Mo., bridge, to Builders Steel Co., Pittsburgh.
100 Tons, Licking County, Ohio, State project, to Burger Iron Co., Akron, Ohio.

WESTERN STATES

- 400 Tons, Sacramento, Cal., warehouse, to Palm Iron & Bridge Works, Sacramento.
240 Tons, Oxnard, Cal., Hueneme pier shed, to Pacific Iron & Steel Co., Los Angeles.
200 Tons, Arsenal, Utah, dunnage for Government bomb storage magazines, to Denver Steel & Iron Co., Denver.

HAWAII

- 1900 Tons, Hickam Field, T. H., engineering shop, to Bethlehem Steel Co., Los Angeles, through Robert E. McKee, Los Angeles, contractor.

PENDING STRUCTURAL PROJECTS

NORTH ATLANTIC STATES

- 3000 Tons, Dunkirk, N. Y., grade crossing eliminations for New York Central and Erie Railroads, bids Jan. 25.
700 Tons, Massena, N. Y., shipping and warehouse building for Aluminum Co. of America.
650 Tons, Stoningham, Conn., State bridge.
550 Tons, Long Island City, N. Y., building for Ford Instrument Co.
200 Tons, Arnold, Pa., extension to melting building for Aluminum Co. of America.
175 Tons, Flushing, N. Y., alterations to exposition building, World's Fair, for Ford Motor Co.
150 Tons, Philadelphia, building, for Northeastern Theatres, Inc.
110 Tons, Saratoga Springs, N. Y., betting ring and pavilion for Saratoga Racing Association.

THE SOUTH

- 1100 Tons, Rutledge, Tex., trash racks, specification No. 891, Marshall Ford Dam, for

Bureau of Reclamation, Denver; bids Jan. 11.

CENTRAL STATES

- 2500 Tons, Chicago, Central Avenue viaduct over Milwaukee Road tracks; bids Jan. 17.
1600 Tons, St. Louis, State bridge; bids Jan. 5.
592 Tons, Chicago, traffic barriers, Chicago Park District, Archer Iron Works, Chicago, low bidder.
515 Tons, Lucas County, Ohio, State project, A. Bentley & Sons, Toledo, low bidders.
300 Tons, Champaign, Ill., power station, University of Illinois; bids Jan. 10.

WESTERN STATES

- 1260 Tons, Scotia, Cal., Eel River bridge; bids Jan. 24.
250 Tons, Portland, Ore., hangar and office

building, for United Air Lines Transport Corp.

FABRICATED PLATES

AWARDS

- 3670 Tons, Denison, Tex., liner plates for Denison dam, to Chicago Bridge & Iron Co., Chicago.
240 Tons, St. Albans, L. I., Jamaica Water Supply Co., 1,000,000 gal. underground tank, to Chicago Bridge & Iron Co., Chicago.

SHEET PILING

PENDING PROJECTS

- 117 Tons, Brown County, Ohio, State project, Midland Construction Co., Columbus, general contractor.
100 Tons, Stonington, Conn., State bridge.

Stearns
MAGNETIC

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DRUMS BRAKES
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CLUTCHES — BRAKES — MAGNETS

STEARNS

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PERSONALS

HERBERT J. WATT, formerly assistant general manager of sales of the Jones & Laughlin Steel Corp., with headquarters at New York, has been appointed manager of sales for the central area by Carnegie-Illinois Steel Corp. Mr. Watt will coordinate sales activities of Carnegie-Illinois offices at Pittsburgh, Cleveland, Cincinnati and Detroit. His headquarters will be established at the general offices of

the corporation, Carnegie Building, Pittsburgh. Mr. Watt entered the steel industry at the Philadelphia office of Carnegie Steel Co. in 1912 and in 1917 was transferred to the Washington office of United States Steel Corp. subsidiaries.

♦ ♦ ♦

C. M. MACKALL, formerly assistant manager of sales, Philadelphia district, Bethlehem Steel Co., Bethlehem, Pa., has been appointed assistant general manager of Western sales, with

headquarters at Detroit. S. C. HUSTED, formerly assigned to sales duties at Philadelphia, has been appointed assistant manager of sales, of the Philadelphia district, succeeding Mr. Mackall. E. H. GUMBART, JR., has been appointed manager of sales, Cincinnati district. Mr. Gumbart was formerly attached to the alloy steel sales division at Bethlehem. He succeeds J. H. RICHARDS, who has been assigned to sales duties in the bolt and nut division at Bethlehem.

Mr. Mackall has been with Bethlehem for 14 years, and had been attached to the Detroit sales office before going to Philadelphia. He was appointed assistant manager of sales at Philadelphia in February, 1938.

Mr. Husted entered the employ of Williamsport Wire Rope Co. in 1925 and was assigned to the Philadelphia office as wire rope salesman when Bethlehem acquired the Williamsport company in August, 1937.

Mr. Gumbart entered Bethlehem's employ in 1919 and was assigned successively to sales duties at Chicago, Cincinnati and Bethlehem. In 1924 he left Bethlehem to engage in the real estate and contracting business. On his return in 1934 he was assigned to the alloy steel sales division.

Mr. Richards was engaged in sales work for the American Iron & Steel Co. at the time of its acquisition by Bethlehem in 1917. He was later attached to the Buffalo sales office, and has been manager of sales at Cincinnati for a number of years.

♦ ♦ ♦

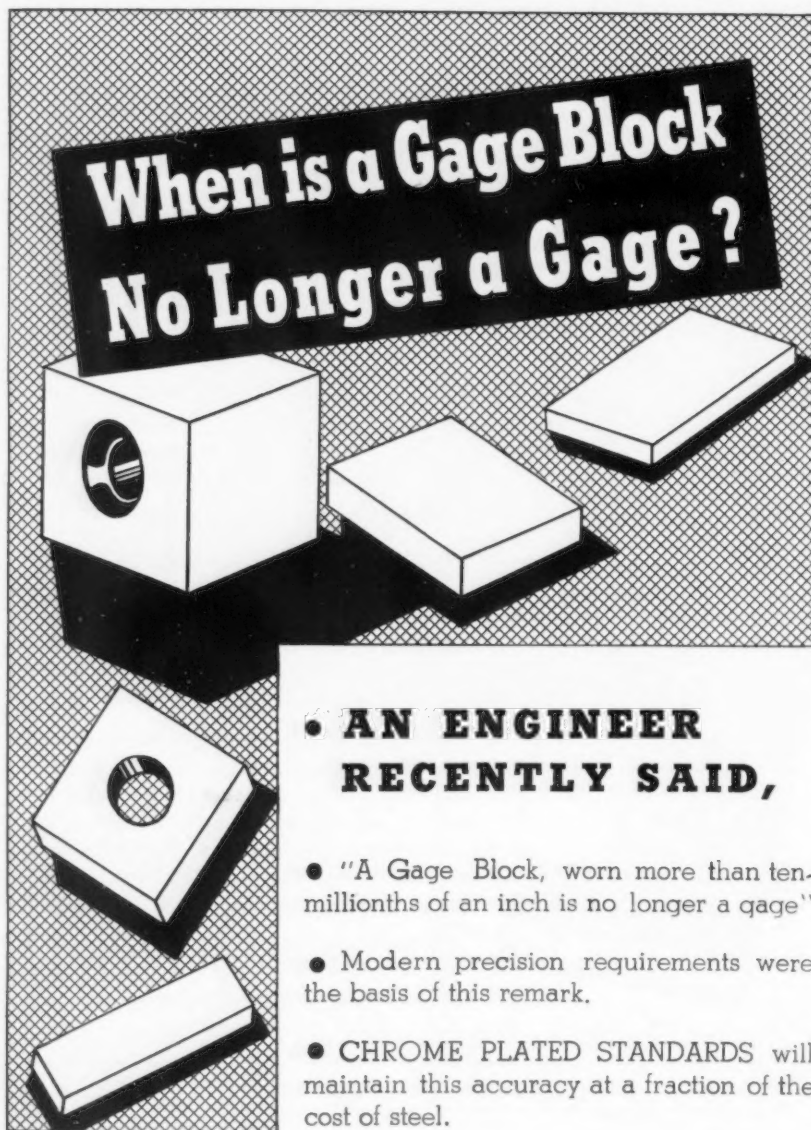
R. D. BAKER has been appointed vice-president and general manager of sales for Pittsburgh Screw & Bolt Corp. He previously was general sales manager for the Pittsburgh district and has been with the company in various sales positions for the past 20 years. Howard L. Keally continues as vice-president and assistant general manager of sales and has been associated with the company for a great number of years in sales capacities.

♦ ♦ ♦

HARRY W. SCHUETZ has been appointed assistant to the president and general manager, Pittsburgh Screw & Bolt Corp.'s Colona division. He has been associated with Pittsburgh Screw & Bolt for the past 15 years and prior to that was for many years superintendent of National Tube Co.'s Pennsylvania works.

♦ ♦ ♦

LOUIS SCHIAVONE, president of Schiavone-Bonomo Corp., Jersey City, N. J., has been appointed a member of the North Jersey Transit Authority by Gov. Harry A. Moore.



**When is a Gage Block
No Longer a Gage?**

- **AN ENGINEER RECENTLY SAID,**
- "A Gage Block, worn more than ten-millionths of an inch is no longer a gage"
- Modern precision requirements were the basis of this remark.
- **CHROME PLATED STANDARDS** will maintain this accuracy at a fraction of the cost of steel.

YOUR OLD GAGE BLOCKS, RECONDITIONED WITH
CHROME PLATE — GIVE YOU ORIGINAL ACCURACIES



DEARBORN GAGE COMPANY

Originators of Chromium Plated Gage Blocks

22037 BEECH STREET

— DEARBORN, MICHIGAN

Largest Plant for Beneficiation Of Iron Ore Built in England

CLEVELAND — Overshadowed by the outbreak of war, an epochal event in the history of British iron making has had very little notice. This event is the completion of two new blast furnaces and ironstone preparation plant of the Appleby-Frodingham Steel Co., Ltd., at Scunthorpe.

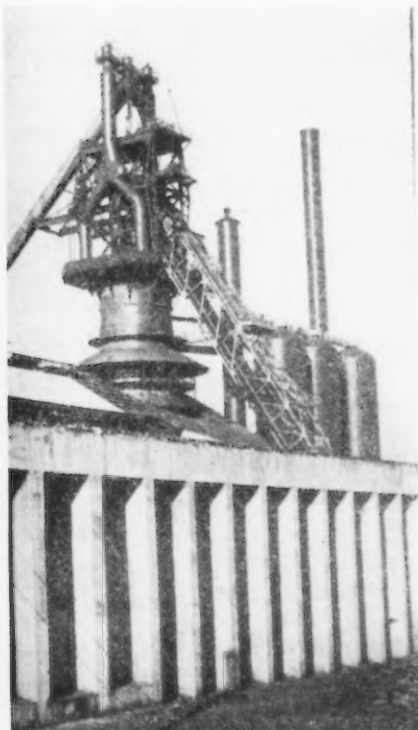
The plant was designed in its entirety and its construction supervised by Arthur G. McKee & Co., Cleveland, Ohio, whose vice-president, William A. Haven, recently returned to the United States after participation in the initial operations.

The plant includes not only by far the largest stacks ever built in England, but no doubt also the largest and most complete plant for the beneficiation of low grade iron ores that there is in the world today. Located at the mines, the plant receives ore in pieces up to four tons in weight and reduces it to a maximum size of 2½ in., at the rate of 800 tons per hr. All material of less than ½-in. size is screened out and sintered. An unique method of ore handling, called a "bedding," the first installation of its kind in the blast furnace field, produces a single uniform grade of ore from the output of a half dozen mines. Previously furnace practice in this district

had been severely handicapped by wide fluctuations in the analysis of the ironstone.

The combined effect of the improvements made in this revolutionary plant has been to reduce the rate of coke consumption about 500 lb. per ton of pig iron and for the first time in history to produce 500 tons of pig iron

per day, in single stacks, from low grade iron ores, which now comprise the bulk of England's reserves. No scrap is used to enrich the normal percentage of iron content, which is less than 25 per cent in the local Lincolnshire stone and averages only 30 per cent after the addition of sinter and Northamptonshire silicious ironstone, which is used for fluxing. Very low silicon and normally low sulphur grades of basic iron are made in slags that run as high as 20 per cent alumina.



A new Appleby-Frodingham blast furnace, with blast furnace trestle in foreground.

SHELDON

Back Geared Screw Cutting PRECISION LATHES



SHELDON LATHES though low in price are quality machine tools in every detail . . . in design, materials, workmanship and in features.

Made in three sizes (10", 11" or 12" swing) the SHELDON Lathe is just the lathe for your experimental department, repair department or tool room. It is also ideally suited for the manufacturing departments . . . fitted with special tools it is a money maker on second operation work. It can be furnished in many styles and combinations. Spindles are hardened and ground, inside and out—even the spindle nose thread is ground. Quick Change or Semi-quick Change Gear Boxes. Plain Aprons or Worm Feed Aprons with Power Cross Feed.

All popular drives.
See the SHELDON before you buy. *Write for catalog.*

SHELDON MACHINE CO
1633 N. KILBOURN AVENUE
CHICAGO, U. S. A.

Lincoln Arc Welding Foundation Announces 2nd \$200,000 Award

A 30-MONTH program of scientific study which will culminate in payment of \$200,000 in awards has been announced by the James F. Lincoln Arc Welding Foundation, Cleveland.

Dedicated to industrial progress, the award program is designed to stimu-

late studies leading to improvements and advancement in design, manufacture, construction, maintenance of every type of product or structure produced or used in the industrial field. Important facts not related to use of arc welding can be included in the papers, and any type of progress

that creates benefits of a social, commercial or industrial nature may be reported.

The foundation was established in January, 1937, and early the same year announced its first award program. Participation closed June 1, 1938, and 382 awards were distributed the following September.

The present program establishes 458 separate awards for outstanding



Rough and Machined CARBON and ALLOY STEEL CASTINGS from 10 pounds to 50 tons, also assembled units.

INGOT MOLD CARS	STEEL ROLLS
SPINDLES	ALLOY STEEL ROLLS
PINION CASTINGS	BLAST FURNACE BELLS
LOCOMOTIVE CASTINGS	ROLL HOUSINGS
GEAR CASTINGS	CHARGING BOX CARS
CHARGING BOXES	BLAST FURNACE HOPPERS
COUPLING BOXES	CINDER LADLES
ANNEALING BOXES	SLAG LADLES
ANNEALING BOTTOMS	COPPER LADLES
ANNEALING POTS	MACHINERY CASTINGS
FREIGHT CAR TRUCK SIDE FRAMES	
FREIGHT CAR TRUCK BOLSTERS	
FREIGHT CAR MISCELLANEOUS CASTINGS	
PITALOY "X" (ALLOY) CASTINGS	

GLASSPORT, PA.



JAMES F. LINCOLN

papers reporting progress in 46 subdivisions of 12 major classifications of industry. Thus participation covers every conceivable machine, building, structure or product made of ferrous or non-ferrous metal. The major classifications are the same as in the previous Award Program, namely, automotive, aircraft, railroad, watercraft, structural, furniture and fixtures, commercial welding, containers, welderies, functional machinery, industry machinery and maintenance.

The first or grand award, for the best progress report submitted, will total \$13,700. Three main program awards of \$10,000, \$7,500, and \$5,000, respectively, have been established, as well as 4 divisional awards of \$700, \$500, \$250, and \$150, respectively, in each of 46 divisions. Finally, 223 awards of \$100 each will be made for papers which do not share in any other award but which are deemed to deserve honorable mention.

Data From A. F. Davis

Participation in the award program is open to everyone who plays any

part in bringing about progress in the design, fabrication, manufacture, construction or maintenance of industrial products or structures. Thus, authors may be executives, engineers, designers, architects, draftsmen or foremen; also proprietors of automotive garages and service stations, and owners and operators of fabricating and repair shops. One author or a group of authors may submit a study. Any company or concern may submit more than one study, provided each is on a different subject and is prepared and submitted by a different author or group of authors.

Participants have until June 1, 1942, to pursue their studies and prepare a report concerning them. Complete data as to classifications, rules of participation and other details may be obtained from A. F. Davis, secretary, The James F. Lincoln Arc Welding Foundation, Cleveland.

Capital Goods Index Declines to 99.4

THE index of capital goods activity compiled by THE IRON AGE declined to 99.4 in the week of Dec. 30, a loss of 5.4 points from the preceding, pre-holiday week, but the highest position recorded in the closing week of any of the past 10 years. In the last week of 1938 the index was at 75.6, in 1937 it was 54.7, in 1936 it was 98.4 and in 1929 it was 80.4. Data for years previous to 1929 are not available.

Extras Revised on Manufacturers' Wire

EFFECTIVE Dec. 19, leading wire producers announced a number of revised extras on manufacturers' wire. The extra for annealing or normalizing is now 30c. per 100 lb. The extra for annealed, cleaned and lime coated wire, 13 gage and coarser, is 50c. per 100 lb., and 14 to 18 gages inclusive 60c. per 100 lb. The charge for annealing, cleaning and oiling is 55c. on 13 gage and coarser and 65c. on 14 to 18 gages inclusive. Formerly the normalizing extra was 37½c. and the annealing extra 15c. up to 15 gage, 20c. to 16 gage, 25c. on 17 and 18 gage. Annealing, cleaning and lime coating charge was 30c. up to 15 gage, 35c. on 15 and 16 gage, and 40c. on 17 and 18 gages, with a charge of 10c. above these extras for annealing, cleaning and oiling.

Because of this change, annealed fence wire is now quoted 3.05c. instead of the former 2.90c.

Sharp Increase in Car Loadings Is Forecast

WASHINGTON—The 13 Shippers' Advisory Boards of the Association of American Railroads estimate 1940 first quarter car loadings of iron and steel at 447,459, an increase of 45.3 per cent of actual 1939 last quarter loadings of 307,914. Other estimates, all increases, compared with

loadings in the last quarter of 1939, the latter given in parentheses, are: coal and coke, 1,889,244 (1,726,870); ore and concentrates, 134,039 (95,222); machinery and boilers, 26,931 (21,575); agricultural implements and vehicles, 25,855 (21,294); automobiles, trucks and parts, 193,238 (162,690). Total loadings for the first quarter are estimated at 5,123,227, an increase of 12.1 per cent over last quarter loadings of 4,570,472.



of CAST STEEL GEAR BLANK

HERE is proof of the facilities offered you by the National-Erie Corporation . . . One of ten cast-steel gear blanks for mine hoists 145.5" Outside Diameter; 30" Face; 27" Bore; Casting Weight,

36,630 lbs. each. Compare this giant with the small Nelo alloy steel cut gears . . . Your inquiries for steel castings and special gearing will receive prompt attention.

NATIONAL-ERIE CORPORATION
ERIE, PA., U.S.A.

...NON-FERROUS...

NEW YORK, Jan. 2—With production schedules interrupted by the holidays and inventory taking, non-ferrous buyers showed little interest in the market in the past week. Price-wise, the only important development of the week was the cut of \$5 a ton in spelter, which brought prices down to 6.14c. per lb., New York, instituted by one seller late Friday. At time of going to press, this price was being quoted by only one seller, but it was indicated that several other smelters expected to acknowledge this level shortly. This new price reduction was wholly unexpected and created considerable confusion and acted to accentuate the steadily sinking trend of sales over the past month.

Quietness prevailed also in the copper market with producers' prices remaining unchanged at 12.50c., per lb., delivered Connecticut Valley. Current production

requirements are being met out of existing contracts and there is little disposition on the part of buyers to cover forward at the present time. It is doubted if any important buying can be expected before the end of January. Current export copper inquiry is very light with 12.30c. to 12.35c. per lb., f.a.s., being offered for January delivery.

Lead buying in the past week showed a slight letdown from the preceding week, but at least one important seller was able to dispose of its intake on several days. Little interest has been shown as yet in the February books, which were opened last week, the bulk of current demand still being for January positions. Approximately 70 per cent of January's needs have thus far been covered. Prices are firm and unchanged at 5.50c. per lb., New York.

Tin deliveries in the United States in

December reached the all-time high of 11,366 tons. November shipments were 7870 tons and October, 6040 tons. The increase in December deliveries is primarily a reaction to the drastic curtailment of deliveries in October and November caused by the sitdown strike of the far eastern producers and the confused shipping situation. The December total also includes unstated exported tonnages. With the exception of Friday, when several hundred tons were purchased, consumers showed little interest in the market during the past week. Prices were easier during the period, with prompt Straits quoted today at 48.75c. per lb., New York, as compared with 50.25c. a week ago.

Steel Scrap

JAN. 2—With buyers still more or less disinterested in making new purchases and with extreme winter weather slowing up and in some localities stopping yard operations, scrap activity in the past week has been exceptionally low. While prices generally are unchanged, and the composite price of No. 1 remains at \$17.67, the tendency of the market is toward firmness despite lack of buying. At Chicago, for example, the bottom of the recent decline in prices appears to have been reached. Mill sales were made there last week at \$16.50, the same as the week before, and while brokers continued to buy freely at \$16.25 and an occasional car for \$16, large tonnages of heavy melting steel have brought more than \$16.25 from some brokers. At Pittsburgh, some stiffening is seen in the fact that broker offers of \$18 are not drawing out much material to cover on old orders. The price range on No. 1 steel is unchanged from last week at \$18 to \$18.50. Likewise, the price on No. 1 remains unchanged at Philadelphia, although reductions up to \$1 have been made on cast grades because of adjustments on certain tonnages shipped against old contracts.

Automotive lists closing at the end of 1939 in Detroit brought prices that indicated a degree of underlying strength and possibly some speculative sentiment. Activity is at a low point, however, and no distinctive movements are expected before mid-month automotive lists are released.

A marked improvement in shipments of material abroad is looked for in coming weeks as the vessel situation becomes more certain. With scrap coming out none too freely at present, buying prices for export are a shade firmer, but no changes in published prices are recorded this week.

NON-FERROUS PRICES

Cents per lb. for early delivery

	Dec. 27	Dec. 28	Dec. 29	Dec. 30	Jan. 2
Copper, Electrolytic ¹	12.50	12.50	12.50	12.50	12.50
Copper, Lake	12.50	12.50	12.50	12.50	12.50
Tin, Straits, New York	50.00	49.25	49.50	....	48.75
Zinc, East St. Louis ²	6.00	6.00	5.75	5.75	5.75
Lead, St. Louis ³	5.35	5.35	5.35	5.35	5.35

¹ Delivered Conn. Valley. Deduct ¼c. for New York delivery. ² Add 0.39c. for New York delivery. ³ Add 0.15c. for New York delivery.

Warehouse Prices

Cents per lb., Delivered

	New York	Cleveland
Tin, Straits, pig	50.75c.	54.00c.
Copper, Lake	13.75c.	13.625c.
Copper, electro	14.00c.	13.625c.
Copper, castings	13.625c.	13.375c.
*Copper sheets, hot-rolled	21.12c.	21.12c.
*Yellow brass sheets	19.31c.	19.31c.
*Seamless brass tubes	22.06c.	22.06c.
*Seamless copper tubes	21.62c.	21.62c.
*Yellow brass rods	15.23c.	15.23c.
Zinc slabs	7.625c.	8.00c.
Zinc sheets, No. 9 casks	12.00c.	12.10c.
Lead, American pig	6.50c.	6.00c.
Lead, bar	8.95c.	8.75c.
Lead, sheets, cut	8.50c.	8.50c.
Antimony, Asiatic	16.00c.	17.00c.
Alum., virgin, 99 per cent plus	21.50c.	22.50c.
Alum., No. 1 remelt., 98 to 99 per cent	19.00c.	19.50c.
Solder, ½ and ½	31.12c.	30.75c.
Babbitt metal, anti-friction grade	27.50c.	Nominal

*These prices, which are also for delivery from Chicago warehouses, are quoted with the following percentages allowed off for extras: on copper sheets, 33¼; on brass sheets and rods, 40; on brass tubes, 33¼, and copper tubes, 40.

Old Metals

Cents per lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators. Selling prices are those charged to consumers after the metal has been prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	10.25c.	10.875c.
Copper, hvy. and wire	9.25c.	9.625c.
Copper, light and bottoms	8.25c.	8.75c.
Brass, heavy	5.50c.	6.00c.
Brass, light	4.625c.	5.375c.
Hvy. machine composition	8.50c.	9.125c.
No. 1 yel. brass turnings	5.25c.	5.75c.
No. 1 red brass or composition turnings	8.125c.	8.625c.
Lead, heavy	4.50c.	4.875c.
Cast aluminum	9.00c.	10.00c.
Sheet aluminum	14.25c.	15.25c.
Zinc	3.125c.	4.375c.

Miscellaneous Non-Ferrous Prices

ALUMINUM, delivered: virgin, 99 per cent plus, 20c.-21c. a lb.; No. 12 remelt No. 2 standard, 19c.-19.50c. a lb. NICKEL, electrolytic, 35c.-36c. a lb. base refinery, lots of 2 tons or more. ANTIMONY, prompt: Asiatic, 16.50c. a lb., New York; American, 13c. a lb., f.o.b. smelter. QUICK-SILVER, \$155 per flask of 76 lb. BRASS INGOTS, commercial 85-5-5-5, 13.00c. a lb.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$18.00 to \$18.50
Railroad heavy melting	19.00 to 19.50
No. 2 heavy melting	16.75 to 17.25
Scrap rails	20.00 to 20.50
Rails 3 ft. and under	22.50 to 23.00
Comp. sheet steel	18.00 to 18.50
Hand bundled sheets	17.00 to 17.50
Heavy steel axle turn.	16.50 to 17.00
Machine shop turnings	12.50 to 13.00
Short shov. turnings	14.00 to 14.50
Mixed bor. & turn.	12.00 to 12.50
Cast iron borings	12.00 to 12.50
Cast iron carwheels	19.50 to 20.00
Heavy breakable cast.	15.50 to 16.00
No. 1 cupola cast	19.00 to 19.50
RR. knuckles & coup.	22.75 to 23.25
Rail coil springs	23.25 to 23.75
Rail leaf springs	23.25 to 23.75
Roll steel wheels	23.25 to 23.75
Low phos. billet crops	24.00 to 24.50
Low phos. punchings	21.50 to 22.00
Low phos. heavy plate	21.00 to 21.50
Railroad malleable	20.50 to 21.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$18.50
No. 2 hvy. mltng. steel.	\$17.50
Hydraulic bund., new.	18.50
Hydraulic bund., old.	15.00 to 15.50
Steel rails for rolling	22.50 to 23.00
Cast iron carwheels	20.00 to 20.50
Hvy. breakable cast.	18.50
No. 1 cast	20.00 to 20.50
Stove plate (steel wks.)	15.00
Railroad malleable	22.90
Machine shop turn.	12.00 to 12.50
No. 1 blast furnace	11.50
Cast borings	11.50 to 12.00
Heavy axle turnings	15.00 to 15.50
No. 1 low phos. hvy.	23.00 to 24.00
Couplers & knuckles	23.00 to 23.50
Roll steel wheels	23.00 to 23.50
Steel axles	23.00 to 23.50
Shafting	23.00 to 23.50
Spec. iron & steel pipe	18.00
No. 1 forge fire	16.00 to 16.50
Cast borings (chem.)	14.00 to 14.50

CHICAGO

Delivered to Chicago district consumers:

Per Gross Ton	
Hvy. mltng. steel	\$16.00 to \$16.50
Auto. hvy. mltng. steel alloy free	15.00 to 15.50
No. 2 auto steel	12.00 to 12.50
Shovelling steel	16.00 to 16.50
Factory bundles	15.25 to 15.75
Dealers' bundles	13.75 to 14.25
No. 1 busheling	14.75 to 15.25
No. 2 busheling, old.	6.00 to 6.50
Roll steel wheels	19.00 to 19.50
Railroad tires, cut	19.25 to 19.75
Railroad leaf springs	18.50 to 19.00
Steel coup. & knuckles	18.50 to 19.00
Axle turnings	15.00 to 15.50
Coil springs	19.50 to 20.00
Axle turn. (elec.)	17.00 to 17.50
Low phos. punchings	19.50 to 20.00
Low phos. plates 12 in. and under	19.00 to 19.50
Cast iron borings	8.50 to 9.00
Short shov. turn.	10.00 to 10.50
Machine shop turn.	8.50 to 9.00
Rerolling rails	19.00 to 19.50
Steel rails under 3 ft.	19.00 to 19.50
Steel rails under 2 ft.	19.50 to 20.00
Angle bars, steel	18.00 to 18.50
Cast iron carwheels	15.25 to 15.75
Railroad malleable	18.50 to 19.00
Agric. malleable	14.50 to 15.00

Per Net Ton	
Iron car axles	21.75 to 22.25
Steel car axles	20.00 to 20.50
Locomotive tires	15.00 to 15.50
Pipes and flues	11.50 to 12.00
No. 1 machinery cast.	13.75 to 14.25
Clean auto. cast	14.00 to 14.50
No. 1 railroad cast.	13.25 to 13.75
No. 1 agric. cast	11.50 to 12.00
Stove plate	10.00 to 10.50
Grate bars	10.00 to 10.50
Brake shoes	11.50 to 12.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$18.50 to \$19.00
No. 2 hvy. mltng. steel.	17.50 to 18.00
Low phos. plate	21.00 to 21.50
No. 1 busheling	17.75 to 18.25
Hydraulic bundles	18.00 to 18.50
Machine shop turn.	12.50 to 13.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$17.50 to \$18.00
No. 2 hvy. mltng. steel.	16.50 to 17.00
Comp. sheet steel	17.25 to 17.75
Light bund. stampings	15.00 to 15.50
Drop forge flashings	16.50 to 17.00
Machine shop turn.	11.50 to 12.00
Short shov. turn.	12.25 to 12.75
No. 1 busheling	16.75 to 17.25
Steel axle turnings	16.50 to 17.00
Low phos. billet and bloom crops	23.50 to 24.00
Cast iron borings	11.50 to 12.00
Mixed bor. & turn.	11.50 to 12.00
No. 2 busheling	11.50 to 12.00
No. 1 cupola cast.	19.50 to 20.00
Railroad grate bars	14.50 to 15.00
Stove plate	14.50 to 15.00
Rails under 3 ft.	22.00 to 22.50
Rails for rolling	21.00 to 21.50
Railroad malleable	21.00 to 21.50

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$17.00 to \$17.50
No. 2 hvy. mltng. steel.	15.00 to 15.50
Scrap rails	17.50 to 18.00
New hvy. b'nded sheets	15.50 to 16.00
Old hydraulic bundles	14.50 to 15.00
Drop forge flashings	15.00 to 15.50
No. 1 busheling	15.00 to 15.50
Machine shop turn.	10.50 to 11.00
Shov. turnings	13.50 to 14.00
Mixed bor. & turn.	11.00 to 11.50
Cast iron borings	11.00 to 11.50
Knuckles & couplers	22.00 to 23.00
Coil & leaf springs	22.00 to 23.00
Roll steel wheels	22.00 to 23.00
No. 1 machinery cast.	18.00 to 18.50
No. 1 cupola cast.	17.00 to 17.50
Stove plate	15.00 to 15.50
Steel rails under 3 ft.	22.50 to 23.00
Cast iron carwheels	18.00 to 18.50
Railroad malleable	19.50 to 20.00

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting	\$15.50 to \$16.00
No. 1 hvy. melting	14.50 to 15.00
No. 2 hvy. melting	14.50 to 15.00
No. 1 locomotive tires	16.50 to 17.00
Misc. stand sec. rails	16.00 to 16.50
Railroad springs	17.00 to 17.50
Bundled sheets	10.00 to 10.50
No. 1 busheling	13.75 to 14.25
Cast bor. & turn.	5.50 to 6.00
Machine shop turn.	7.00 to 7.50
Heavy turnings	10.50 to 11.00
Rails for rolling	18.00 to 18.50
Steel car axles	19.50 to 20.00
No. 1 RR. wrought	11.00 to 11.50
No. 2 RR. wrought	14.50 to 15.00
Steel rails under 3 ft.	19.00 to 19.50
Steel angle bars	16.00 to 16.50
Cast iron carwheels	18.00 to 18.50
No. 1 machinery cast.	17.00 to 17.50
Railroad malleable	16.00 to 16.50
No. 1 railroad cast.	16.00 to 16.50
Stove plate	11.00 to 11.50
Grate bars	10.50 to 11.00
Brake shoes	11.00 to 11.50

CINCINNATI

Dealers' buying prices per gross ton at yards:

No. 1 hvy. mltng. steel.	\$14.00 to \$14.50
No. 2 hvy. mltng. steel.	12.00 to 12.50
Scrap rails for mltng.	18.00 to 18.50
Loose sheet clippings	9.50 to 10.00
Hydrau. b'nded sheets	13.50 to 14.00
Cast iron borings	5.00 to 5.50
Machine shop turn.	6.00 to 6.50
No. 1 busheling	10.50 to 11.00
No. 2 busheling	4.00 to 4.50
Rails for rolling	19.50 to 20.00
No. 1 locomotive tires	15.50 to 16.00
Short rails	21.00 to 21.50
Cast iron carwheels	16.00 to 16.50
No. 1 machinery cast.	17.50 to 18.00
No. 1 railroad cast.	15.50 to 16.00
Burnt cast	9.00 to 9.50
Stove plate	9.00 to 9.50
Agricul. malleable	14.00 to 14.50
Railroad malleable	17.00 to 17.50
Mixed hvy. cast.	15.00 to 15.50

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting steel	\$17.00
No. 2 hvy. melting steel	16.00
No. 1 busheling	14.00
Scrap steel rails	16.00
Steel rails under 3 ft.	17.00

Rails for rolling	17.50
Long turnings	6.00
Cast iron borings	8.50
Stove plate	11.00
Steel axles	21.00
No. 1 RR. wrought	15.00
No. 1 cast	16.00
No. 2 cast	12.00
Cast iron carwheels	14.00
Steel car wheels	17.00

DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. industrial steel	\$13.00 to \$13.50
No. 2 hvy. mltng. steel	12.00 to 12.50
Borings and turnings	7.00 to 7.50
Long turnings	6.50 to 7.00
Short shov. turnings	8.50 to 9.00
No. 1 machinery cast.	13.50 to 14.00
Automotive cast	15.00 to 15.50
Hvy. breakable cast	10.50 to 11.00
Stove plate	9.00 to 9.50
Hydraul. comp. sheets	13.75 to 14.25
New factory bushel.	12.50 to 13.00
Sheet clippings	8.75 to 9.75
Flashings	12.00 to 12.50
Low phos. plate scrap	13.75 to 14.25

NEW YORK

Dealers' buying prices per gross ton on cars:

No. 1 hvy. mltng. steel.	\$14.00 to \$14.50
No. 2 hvy. mltng. steel.	13.00 to 13.50
Hvy. breakable cast.	16.00 to 16.50
No. 1 machinery cast.	16.00 to 16.50
No. 2 cast	12.50 to 13.00
Stove plate	11.00 to 11.50
Steel car axles	19.00 to 20.00
Shafting	19.00 to 20.00
No. 1 RR. wrought	14.00 to 15.00
No. 1 wrought long	12.50 to 13.00
Spec. iron & steel pipe	13.50 to 14.00
Rails for rolling	19.00 to 20.00
Clean steel turnings*	8.00 to 8.50
Cast borings*	8.00 to 9.00
No. 1 blast furnace	8.00 to 9.00
Cast borings (chem.)	Nominal
Unprepared yard scrap	8.50 to 9.00
Light iron	5.00 to 5.50
Per gross ton, delivered local foundries:	
No. 1 machin. cast.	\$20.00 to \$22.00
No. 2 cast	18.50 to 19.00

* \$1.50 less for truck loads.

BOSTON

Dealers' buying prices per gross ton

Breakable cast	\$13.00 to \$13.15
Machine shop turn.	6.75 to 7.00
Mixed bor. & turn.	6.00 to 6.25
Bun. skeleton long.	9.50 to 10.00
Shafting	18.25 to 18.50
Stove plate	10.50 to 10.65
Cast bor. chemical	9.00 to 9.50
Per gross ton delivered consumers' yards:	
Textile cast	\$16.00 to \$17.50
No. 1 machine cast.	16.00 to 17.50
Per gross ton delivered dealers' yards:	
No. 1 hvy. mltng. steel.	\$14.00
No. 2 steel	13.00

PACIFIC COAST

Dealers' buying prices per gross ton on cars:

No. 1 hvy. mltng. steel.	\$16.00 to \$17.50
No. 2 hvy. mltng. steel.	15.00 to 16.50

CANADA

Dealers' buying prices at these yards, per gross ton:

Toronto Montreal	
Low phos. steel	\$12.00 \$11.50
No. 1 hvy. mltng. steel.	11.25 10.75
No. 2 hvy. mltng. steel.	10.00 9.50
Mixed dealers steel	9.25 8.75
Drop forge flashings	10.00 9.50
New loose clippings	9.00 8.50
Busheling	5.50 5.00
Scrap pipe	8.00 7.50
Steel turnings	6.25 5.75
Cast borings	5.75 5.25
Machinery cast	16.50 16.00
Dealers' cast	15.50 15.00
Stove plate	11.50 11.00

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered, barges	
No. 1 hvy. mltng. steel.	\$14.50 to \$15.00
No. 2 hvy. mltng. steel.	13.00 to 13.50
No. 2 cast	13.00 to 13.50
Stove plate	10.50 to 11.00

Boston on cars at Army Base or Mystic Wharf

No. 1 hvy. mltng. steel.	\$15.75 to \$16.00
No. 2 hvy. mltng. steel.	14.75 to 15.00
Rails (scrap)	16.00
Stove plate	11.50

Philadelphia, delivered alongside boats, Port Richmond.

No. 1 hvy. mltng. steel.	Nominal
No. 2 hvy. mltng. steel.	Nominal

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

Steel prices on these pages are base prices only and f.o.b. mill unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, deductions, and in most cases the amount of freight which must be absorbed in order to meet competition

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (Rerolling only). Prices delivered Detroit are \$2 higher. F.o.b. Duluth, billets only, \$2 higher.

Per Gross Ton
Rerolling * \$34.00
Forging quality 40.90

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton
Open hearth or besse-mer \$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

Per Lb.
Grooved, universal and sheared 1.90c.

Wire Rods

(No. 5 to 9/32 in.)

Per Lb.
Pittsburgh, Chicago or Cleveland 2.00c.
Worcester, Mass. 2.10c.
Birmingham 2.00c.
San Francisco 2.45c.
Galveston 2.25c.
9/32 in. to 47/64 in. \$3 a net ton higher. Quantity extras apply.

SOFT STEEL BARS

Base per Lb.
Pittsburgh, Chicago, Gary, Cleveland, Buffalo and Birmingham 2.15c.
Detroit, delivered 2.25c.
Duluth 2.25c.
Philadelphia, delivered 2.47c.
New York 2.49c.
On cars dock Gulf ports 2.50c.
On cars dock Pacific ports 2.75c.

RAIL STEEL BARS

(For merchant trade)

Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham 2.15c.
On cars dock Tex. Gulf ports.. 2.50c.
On cars dock Pacific ports.... 2.75c.

BILLET STEEL REINFORCING BARS

(Straight lengths as quoted by distributors)

Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Cleveland, Youngstown or Sparrows Pt. 2.15c.
Detroit, delivered 2.25c.
On cars dock Tex. Gulf ports.. 2.50c.
On cars dock Pacific ports.... 2.50c.

RAIL STEEL REINFORCING BARS

(Straight lengths as quoted by distributors)

Pittsburgh, Chicago, Gary, Buffalo, Cleveland, Youngstown or Birmingham 2.15c.
Detroit, delivered 2.25c.
On cars dock Tex. Gulf ports.. 2.50c.
On cars dock Pacific ports.... 2.50c.

IRON BARS

Chicago and Terre Haute..... 2.15c.
Pittsburgh (refined) 3.60c.

COLD FINISHED BARS AND SHAFTING*

Pittsburgh, Buffalo, Cleveland, Chicago, and Gary 2.65c.
Detroit 2.70c.

* In quantities of 20,000 to 39,999 lb.

PLATES

Base per Lb.
Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont, Del. 2.10c. to 2.35c.

Philadelphia, del'd 2.15c. to 2.40c.
New York, del'd..... 2.29c. to 2.54c.
On cars dock Gulf ports..... 2.45c.
On cars dock Pacific ports..... 2.60c.
Wrought iron plates, P'tg.... 3.80c.

FLOOR PLATES

Pittsburgh or Chicago 3.35c.
New York, del'd 3.71c.
On cars dock Gulf ports 3.70c.
On cars dock Pacific ports.... 3.95c.

STRUCTURAL SHAPES

Base per Lb.
Pittsburgh, Chicago, Gary, Buffalo, Bethlehem or Birmingham 2.10c.
Philadelphia, del'd 2.215c.
New York, del'd 2.27c.
On cars dock Gulf ports..... 2.45c.
On cars dock Pacific ports.... 2.70c.

STEEL SHEET PILING

Base per Lb.
Pittsburgh, Chicago or Buffalo 2.40c.
On cars dock Gulf ports..... 2.85c.
On cars dock Pacific ports.... 2.90c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill
Standard rails, heavier than 60 lb., per gross ton..... \$40.00
Angle bars, per 100 lb. 2.70

F.o.b. Basing Points
Light rails (from billets) per gross ton \$40.00
Light rails (from rail steel) per gross ton 39.00

Base per Lb.
Cut spikes 3.90c.
Screw spikes 4.55c.
Tie plates, steel 2.15c.
Tie plates, Pacific Coast ports. 2.25c.
Track bolts, to steam railroads 4.15c.
Track bolts to jobbers, all sizes (per 100 counts) 65-5

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minneapolis, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS

Hot Rolled

Base per Lb.
Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown or Chicago 2.10c.
Detroit, delivered 2.20c.
Philadelphia, delivered 2.27c.
Granite City 2.20c.
On cars dock Pacific ports.... 2.60c.
Wrought iron, Pittsburgh 4.10c.

Cold Rolled*

Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown or Chicago 3.05c.
Detroit, delivered 3.15c.
Granite City 3.15c.
Philadelphia, delivered 3.37c.
On cars dock Pacific ports.... 3.65c.

* Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base.
From May 10 up to and including May 15, reductions from the base price of hot and cold rolled sheets running from \$4 to \$8 a ton were prevalent. Concessions withdrawn, on May 15.
Subsequent to May 15, many orders originally placed at \$4 to \$6 below the base price were adjusted to the full \$8 concession.

Galvanized Sheets, 24 Gage

Pittsburgh, Chicago, Gary, Sparrows Point, Buffalo, Middletown, Youngstown or Birmingham 3.50c.
Philadelphia, del'd 3.67c.
Granite City 3.60c.
On cars dock Pacific ports.... 4.00c.
Wrought iron, Pittsburgh 6.10c.

Electrical Sheets (F.o.b. Pittsburgh)

Base per Lb.
Field grade 3.20c.
Armature 3.55c.

Electrical 4.05c.
Motor 4.95c.
Dynamo 5.65c.
Transformer 72 6.15c.
Transformer 65 7.15c.
Transformer 58 7.65c.
Transformer 52 8.45c.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extra plus 25¢ per 100 lb. for coils. Pacific ports add 70¢. a 100 lb.

Long Ternes

No. 24 unassorted 8-lb. coating f.o.b. Pittsburgh or Gary.... 3.80c.
F.o.b. cars dock Pacific ports. 4.50c.

Vitreous Enameling Stock, 20 Gage*

Pittsburgh, Chicago, Gary, Youngstown, Middletown or Cleveland 3.35c.
Detroit, del'd 3.45c.
Granite City 3.45c.
On cars dock Pacific ports.... 3.95c.

TIN MILL PRODUCTS

*Tin Plate

Per Base Box
Standard cokes, Pittsburgh, Chicago and Gary \$5.00
Standard cokes, Granite City.. 5.10

* Prices effective Nov. 10 on shipments through first quarter of 1939.

Special Coated Manufacturing Ternes

Per Base Box
Granite City \$4.40
Pittsburgh or Gary 4.30

Roofing Terne Plate

(F.o.b. Pittsburgh per Package, 112 sheets)

	20x14 in.	20x28 in.
8-lb. coating I.C.	\$6.00	\$12.00
15-lb. coating I.C.	7.00	14.00
20-lb. coating I.C.	7.50	15.00
25-lb. coating I.C.	8.00	16.00
30-lb. coating I.C.	8.63	17.25
40-lb. coating I.C.	9.75	19.50

Black Plate, 29 gage and lighter
Pittsburgh, Chicago and Gary 3.05c.
Granite City 3.15c.
On cars dock Pacific ports, boxed 4.00c.

HOT ROLLED STRIP

(Widths up to 12 in.)

Base per Lb.
Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown or Birmingham 2.10c.
Detroit, delivered 2.20c.
On cars dock Pacific ports.... 2.70c.

Cooperage Stock

Pittsburgh & Chicago 2.20c.
From May 10 up to and including May 15, reductions in the base price of hot rolled strip running from \$4 to \$8 a ton were prevalent. Concessions withdrawn on May 15.
Subsequent to May 15, many orders originally placed at \$4 to \$6 below the base price were adjusted to the full \$8 concession.

COLD ROLLED STRIP*

Base per Lb.
Pittsburgh, Youngstown or Cleveland 2.80c.
Chicago 2.90c.
Detroit, delivered 2.90c.
Worcester 3.00c.

* Carbon 0.25 and less.

Commodity Cold Rolled Strip
Pittsburgh, Youngstown, or Cleveland 2.95c.
Detroit, delivered 3.05c.
Worcester 3.35c.

From May 10 up to and including May 15, reductions from the base price of cold rolled strip amounting to \$4 a ton were prevalent. Concessions withdrawn on May 15.

COLD ROLLED SPRING STEEL

Pittsburgh and Cleveland Worcester
Carbon 0.26-0.50% 2.80c. 3.00c.
Carbon 0.51-0.75 4.30c. 4.50c.
Carbon 0.76-1.00 6.15c. 6.35c.
Carbon 1.01-1.25 8.35c. 8.55c.

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	\$24.00
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	24.00
Delivered Brooklyn	26.50
Delivered Newark or Jersey City	25.53
Delivered Philadelphia	24.84
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago, Granite City, Cleveland and Youngstown	23.00
F.o.b. Buffalo	23.00
F.o.b. Detroit	23.00
Southern, delivered Cincinnati	23.06
Northern, delivered Cincinnati	23.44
F.o.b. Duluth	23.50
F.o.b. Provo, Utah	21.00
Delivered, San Francisco, Los Angeles or Seattle	26.50
F.o.b. Birmingham*	19.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 0.70 per cent and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same, except at Birmingham and Provo, which are not malleable iron basing points.

Basic

F.o.b. Everett, Mass.	\$23.50
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	23.50
F.o.b. Buffalo	22.00
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago, Granite City, Cleveland and Youngstown	22.50
Delivered Philadelphia	24.34
Delivered Canton, Ohio	23.89
Delivered Mansfield, Ohio	24.44
F.o.b. Birmingham	18.00

Bessemer

F.o.b. Buffalo	\$24.00
F.o.b. Everett, Mass.	25.00
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	25.00
Delivered Newark or Jersey City	26.53
Erie, Pa., and Duluth	24.00
F.o.b. Neville Island, Toledo, Chicago and Youngstown	23.50
F.o.b. Birmingham	24.00
Delivered Cincinnati	24.11
Delivered Canton, Ohio	24.89
Delivered Mansfield, Ohio	25.44

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Buffalo.....\$28.50

Gray Forge

Valley or Pittsburgh furnace..\$22.50

Charcoal

Lake Superior furnace	\$27.00
Delivered Chicago	30.34

Canadian Pig Iron

Per Gross Ton

Montreal

Foundry iron	\$27.50 base
Malleable	28.00 base
Basic	27.50 base

Toronto

Foundry iron	\$25.50 base
Malleable	26.00 base
Basic	25.50 base

On all grades 2.25 per cent silicon and under is base. For each 25 points of silicon over 2.25 per cent an extra of 25c. is charged.

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload).....\$100.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%.....\$32.00

Domestic, 26 to 28%.....39.50

Electric Ferrosilicon

Per Gross Ton Delivered; Lump Size

50% (ton lots, packed).....\$82.00*

50% (ton lots in 50 gal. bbl.).. 80.50*

75% (carload lots, bulk).....126.00*

75% (ton lots, packed).....142.00*

Bessemer Ferrosilicon

F.o.b. Furnace, Jackson, Ohio

Per Gross Ton

10.00 to 10.50%.....\$32.50

For each additional 0.50% silicon up to 12%, 50c. per ton is added. Above 12% add 75c. per ton.

For each unit of manganese over 2%, \$1 per ton additional.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 5.00 to

5.50%.....\$27.50

For each additional 0.5% silicon up to 12%, 50c. a ton is added. Above 12% add 75c. a ton.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Ferrochrome

Per Lb. Contained Cr., Delivered Carlots, Lump Size, on Contract

4 to 6% carbon.....11.00c.*

2% carbon.....17.50c.*

1% carbon.....18.50c.*

0.10% carbon.....20.50c.*

0.06% carbon.....21.00c.*

Silico-Manganese

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract

8% carbon.....\$98.00

2.50% carbon.....102.00

2% carbon.....108.00

1% carbon.....118.00

Other Ferroalloys

Ferrotungsten, per lb. contained W del. carloads.... \$2.00

Ferrotungsten, 100 lbs. and less 2.25

Ferrovandium, contract per lb. contained V., delivered.....\$2.70 to \$2.90†

Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., ton lots \$2.25†

Ferrocobaltitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton.....\$142.50

Ferrocobaltitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton.....\$157.50

Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage, freight equalized with Rockdale, Tenn., per gross ton.....\$58.50

Ferrophosphorus, electrolytic 23-26% in car lots, f.o.b. Monsanto (Siglo), Tenn., 24%, per gross ton, \$3 unitage, freight equalized with Nashville.....\$75.00

Ferromolybdenum, per lb. Mo. f.o.b. furnace.....95c.

Calcium molybdate, per lb. Mo. f.o.b. furnace.....80c.

Molybdenum oxide briquettes 48-52% Mo; per lb. contained Mo. f.o.b. Langeloth, Pa.....80c.

* Spot prices are \$5 per ton higher.

† Spot prices are 10c. per lb. of contained element higher.

*ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50%...\$5.25

Old range, non-Bessemer, 51.50% 5.10

Messabi, Bessemer, 51.50%.....5.10

Messabi, non-Bessemer, 51.50% 4.95

High phosphorus, 51.50%.....4.85

Foreign Ores*

C.i.f. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, .55 to 58% dry, Algeria.....18c.

Iron, low phos., Swedish, average, 68 1/4% iron.....13c.

Iron, basic or foundry, Swedish, aver. 65% iron.....11c.

Iron, basic or foundry, Russian, aver. 65% iron.....Nominal

Man., Caucasian, washed 52%.....50c.

Man., African, Indian, 44-48%.....45c.

Man., African, Indian, 49-51%.....45c.

Man., Brazilian, 46 to 48%.....44c.

Per Short Ton Unit

Tungsten, Chinese, Wolframite, duty paid, delivered.....\$23.00 to \$24.00

Tungsten, domestic, scheelite delivered.....23.00 to 25.00

Chrome or (lump) c.i.f. Atlantic Seaboard, per gross ton: South African (low grade).....\$18.00

Rhodesian, 45%.....22.00

Rhodesian, 48%.....25.00

Turkish, 48-49%.....29.00

Turkish, 45-46%.....24.50

Turkish, 40-41%.....22.00

Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton: 50%.....Nominal

48-49%.....Nominal

* All foreign ore prices are nominal

FLUORSPAR

Per Net Ton

Domestic washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail.....\$22.00

Domestic, f.o.b. Ohio River landing barges.....\$22.00

No. 2 lump, 85-5, f.o.b. Kentucky and Ill. mines.....\$20.00 to 22.00

Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid.....\$25.00 to \$25.50

Domestic No. 1 ground bulk, 96 to 98%, calcium fluoride, not over 2 1/2% silicon, f.o.b. Illinois and Kentucky mines.....\$31.00

ditto, in bags, f.o.b., same mines.....\$32.60

FUEL OIL

Per Gal.

No. 2, f.o.b. Bayonne, N. J.....4.70c.

No. 6, f.o.b. Bayonne, N. J.....2.74c.

No. 5 Bur. Stds., del'd Chicago 3.25c.

No. 6 Bur. Stds., del'd Chicago 2.75c.

No. 3 distillate, del'd Cleve'd. 5.375c.

No. 4 industrial, del'd Cleve'd. 5.125c.

No. 5 industrial, del'd Cleve'd. 4.25c.

No. 6 industrial, del'd Cleve'd. 4.00c.

COKE

Per Net Ton

Furnace, f.o.b. Connells-ville, Prompt.....\$4.50 to \$4.75

Foundry, f.o.b. Connells-ville, Prompt.....5.50 to 6.00

Foundry, by - product Chicago ovens.....10.50

Foundry, by - product del'd New England.....12.50

Foundry, by - product del'd Newark or Jersey City.....11.38 to 11.90

Foundry, by - product Philadelphia.....11.13

Foundry, by - product delivered Cleveland... 11.05

Foundry, by - product delivered Cincinnati... 10.50

Foundry, Birmingham... 7.50

Foundry, by - product del'd St. Louis industrial district.....10.75 to 11.00

Foundry, from Birmingham, f.o.b. cars dock Pacific ports.....14.75

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh, Chicago, Cleveland and Birmingham)

To Manufacturing Trade

	Per Lb.
Bright wire	2.60c.
Galvanized wire, base	2.65c.*
Spring wire	3.20c.

* On galvanizing wire to manufacturing trade, size and galvanizing extras are charged, the price Nos. 6 to 9 gage, inclusive, thus being 3.15c.

To the Trade

	Base per Keg
Standard wire nails	\$2.55
Coated nails	2.55
Cut nails, carloads	3.85

	Base per 100 Lb.
Annealed fence wire	\$3.05
Galvanized fence wire	3.30
Twisted barless wire	3.40
Woven wire fence, No. 11 and heavier, base col.	70
Woven wire fence, lighter than No. 11, base col.	67
Single loop bale ties, base col.	56
Stand, 2 pt., 12.5 gage barbed cattle wire, per 80 rod spool	\$2.70
Stand, 2 pt., 12.5 gage barbed hog wire, per 80 rod spool	\$2.88

Note: Birmingham base same on above items, except spring wire.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills
F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld	
Steel	Wrought Iron
In.	Black Galv.
1/2	36
3/4	38
1	40
1 1/4	42
1 1/2	44
1 3/4	46
2	48
2 1/2	50
3	52
3 1/2	54
4	56
4 1/2	58
5	60
5 1/2	62
6	64
6 1/2	66
7	68
7 1/2	70
8	72
8 1/2	74
9	76
9 1/2	78
10	80
10 1/2	82
11	84
11 1/2	86
12	88
12 1/2	90
13	92
13 1/2	94
14	96
14 1/2	98
15	100

Lap Weld	
Steel	Wrought Iron
In.	Black Galv.
1/2	36
3/4	38
1	40
1 1/4	42
1 1/2	44
1 3/4	46
2	48
2 1/2	50
3	52
3 1/2	54
4	56
4 1/2	58
5	60
5 1/2	62
6	64
6 1/2	66
7	68
7 1/2	70
8	72
8 1/2	74
9	76
9 1/2	78
10	80
10 1/2	82
11	84
11 1/2	86
12	88
12 1/2	90
13	92
13 1/2	94
14	96
14 1/2	98
15	100

Butt weld, extra strong, plain ends	
Steel	Wrought Iron
In.	Black Galv.
1/2	36
3/4	38
1	40
1 1/4	42
1 1/2	44
1 3/4	46
2	48
2 1/2	50
3	52
3 1/2	54
4	56
4 1/2	58
5	60
5 1/2	62
6	64
6 1/2	66
7	68
7 1/2	70
8	72
8 1/2	74
9	76
9 1/2	78
10	80
10 1/2	82
11	84
11 1/2	86
12	88
12 1/2	90
13	92
13 1/2	94
14	96
14 1/2	98
15	100

Lap weld, extra strong, plain ends	
Steel	Wrought Iron
In.	Black Galv.
1/2	36
3/4	38
1	40
1 1/4	42
1 1/2	44
1 3/4	46
2	48
2 1/2	50
3	52
3 1/2	54
4	56
4 1/2	58
5	60
5 1/2	62
6	64
6 1/2	66
7	68
7 1/2	70
8	72
8 1/2	74
9	76
9 1/2	78
10	80
10 1/2	82
11	84
11 1/2	86
12	88
12 1/2	90
13	92
13 1/2	94
14	96
14 1/2	98
15	100

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount of \$4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or \$2 a ton higher, on all butt weld 8 in. and smaller.

Boiler Tubes

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes. Minimum Wall. (Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

In.	O.D.	B.W.G.	Seamless		Lap Weld
			Cold Drawn	Hot Rolled	
1	in.	12	10.87	10.82	10.82
1 1/4	in.	13	11.70	10.23	10.72
1 1/2	in.	13	13.42	11.64	11.06
2	in.	13	15.03	13.04	12.38
2 1/4	in.	13	16.76	14.54	13.79
2 1/2	in.	12	18.45	16.01	15.16
2 3/4	in.	12	20.21	17.54	16.58
3	in.	12	21.42	18.59	17.54
3 1/4	in.	12	22.48	19.59	18.35
3 1/2	in.	11	28.37	24.82	23.15
4	in.	10	35.20	30.54	28.66
4 1/4	in.	10	43.04	37.35	35.22
5	in.	9	54.01	46.87	44.25
6	in.	7	82.93	71.96	68.14

Extras for less carload quantities:	
40,000 lb. or ft. or over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	30%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

CAST IRON WATER PIPE

Per Net Ton

*6-in. and larger, del'd Chicago	\$54.80
6-in. and larger, del'd New York	52.20
*6-in. and larger, Birmingham	46.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	52.00
F.o.b. dock, Seattle	52.00
4-in. f.o.b. dock, San Francisco or Los Angeles	55.00
F.o.b. dock, Seattle	52.00

Class "A" and gas pipe, \$3 extra 4-in. pipe is \$3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is \$45, Birmingham, and \$53.80 delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland Birmingham or Chicago)

Per Cent Off List

Machine and carriage bolts:	
1/2 in. and 6 in. and smaller	68 1/2
Larger and longer up to 1 in.	66
1 1/2 in. and larger	64
Lag bolts	66
Plow bolts, Nos. 1, 2, 3, and 7	68 1/2
Hot pressed nuts, and c.p.c. and t-nuts, square or hex. blank or tapped:	
1/2 in. and smaller	67
3/16 in. to 1 in. inclusive	64
1 1/2 in. to 1 1/2 in. incl.	62
1 1/2 in. and larger	60

On the above items with the exception of plow bolts, there is an additional allowance of 10 per cent for full container quantities.

On all of the above items there is an additional 5 per cent allowance for carload shipments.

Semi-fin. hexagon nuts U.S.S. S.A.E.	
1/2 in. and smaller	67
3/16 in. to 1 in.	64
1 1/2 in. and larger	62

In full container lots, 10 per cent additional discount.

Stove bolts in packages, with nuts loose	72 1/2
Stove bolts in packages, with nuts attached, add 15% extra.	83 1/2
Stove bolts in bulk	83 1/2

On stove bolts freight is allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

Large Rivets

(1/2 in. and larger)

Base per 100 Lb.

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	\$3.40
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Small Rivets

(7/16 in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	65 and 10
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Cap and Set Screws

(Freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.)

Per Cent Off List

Milled hexagon head, cap screws, 1 in. dia. and smaller	50 and 10
Milled headless set screws, cut thread 1/4 in. and larger	64
3/16 in. and smaller	73
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller	70
Upset set screws, cup and oval points	75
Milled studs	52

Alloy Steel

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem. Base price, \$56.00 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.	
Open-hearth grade, base	2.70c.
Delivered, Detroit	2.80c.
S.A.E. Series	Differential
Numbers	per 100 Lb.
200 (1/2% Nickel)	\$0.35

2100 (1 1/2% Nickel)	\$0.75
2300 (3 1/2% Nickel)	1.55
2500 (5% Nickel)	2.25
31 Nickel-chromium	0.70
3200 Nickel-chromium	1.85
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum)	0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum)	0.75
4340 Chr.-Ni.-Mo.	1.65
4345 Chr.-Ni.-Mo.	1.85
4600 Nickel - molybdenum (0.20 to 0.30 Mo. 1.50 to 2.00 Ni.)	1.10
5100 Chrome steel (0.60-0.90 Cr.)	0.35
5100 Chrome steel (0.80-1.10 Cr.)	0.45
6100 Chromium spring steel	0.15
6100 Chromium-vanadium bar	1.20
6100 Chromium-vanadium spring steel	0.85
Chromium-nickel vanadium	1.50
Carbon-vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.35c. base per lb. Delivered Detroit, 3.45c., carlots.

STAINLESS & HEAT RESISTANT ALLOYS

(Base prices, cents per lb. f.o.b. Pittsburgh)

Chrome-Nickel	
No. 304	No. 302
Forging billets	21.25c.
Bars	25c.
Plates	29c.
Structural shapes	25c.
Sheets	36c.
Hot-rolled strip	23.50c.
Cold-rolled strip	30c.
Drawn wire	25c.

Straight Chrome	
No. 410	No. 430
Bars	18.50c.
Plates	21.50c.
Sheets	26.50c.
Hot stp.	17c. 17.50c.
Cold stp.	22c. 22.50c.

TOOL STEEL

High speed	67c.
High-carbon-chrome	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 8c. a lb. higher.

British and Continental

BRITISH

Per Gross Ton f.o.b. United Kingdom Ports

Ferromanganese, export	Nominal
Tin plate, per base box	31s. 6d.
Steel bars, open hearth	12£ 5s.*
Beams, open hearth	11£ 2s. 6d.*
Channels, open hearth	11£ 7s. 6d.*
Angles, open hearth	11£ 2s. 6d.*
Black sheets, No. 24 gage	15£ 12s. 6d. max.*
Galvanized sheets, No. 24 gage	18£ 2s. 6d. max.*

* Empire markets only.

CONTINENTAL

Per Gross Ton, Belgian Francs f.o.b. Continental Ports

Bars, merchant	1500
Plates	1750
Joists	1475
Sheets, thin	1900

Above prices are minimum base to which 100 francs should be added to cover war risk insurance, freight charges, etc.

Henry G. Dalton Dies at 77 After Long, Eventful Career

THE long and distinguished career of Henry G. Dalton, senior partner in Pickands, Mather & Co., Cleveland, and chairman of Youngstown Sheet & Tube Co., ended Dec. 27 in a Cleveland hospital when he died from broncho-pneumonia.

A dominant figure in the development of the iron, steel and shipping industries, Mr. Dalton's loss is mourned by leaders throughout the nation. He was also noted for his civic and cultural contributions.

Mr. Dalton had been confined to his home for about a year. On Dec. 20 he was taken to Lakeside Hospital, Cleveland, for an appendectomy. His long fight to regain his health against seemingly impossible odds made doubtful his recovery.

Mr. Dalton was born in Cleveland, Oct. 3, 1862, the son of Frederick and Ellen Dalton. After education in the Cleveland public schools, he sought employment at the age of 14 in a Cleveland railroad office, rising from a handy boy to the post of freight checker in seven years.

Acquaintanceship on the iron ore docks with the late Samuel Mather, Cleveland iron ore executive, who frequently watched his company's boats being unloaded, bore fruit in 1883 when Mr. Mather told young Dalton that he and Col. James Pickands and Jay C. Morse were about to start a partnership and needed a clerk. Mr. Dalton accepted the position.

Before long he was promoted to bookkeeper, and in 1893, 10 years after joining the new company, he became the fourth partner added to the firm. Two others, William McLaughlin and W. P. Murray, were added as partners within a short time. Mr. Dalton was the last survivor of the first six partners.

The company expanded its ore property holdings, became increasingly active in pig iron sales through its blast furnaces along the Great Lakes, and became a factor in the steel industry through the company's and partners' holdings.

Prominent in Merger Battle

In 1930 Mr. Dalton figured in the legal battle over the proposed merging of Bethlehem Steel Co. and Youngstown Sheet & Tube Co. He was a di-

rector in both companies but resigned from the Bethlehem board.

In 1932 Mr. Dalton succeeded the late James A. Campbell as chairman of the board of Youngstown Sheet & Tube.

As President of Interlake Steamship Co., with 47 vessels, he directed one of the largest shipping enterprises on the Great Lakes.

He had been a director of the National City Bank of Cleveland; the



HENRY G. DALTON

Missouri Pacific Railroad; the New Orleans, Texas & Mexican Railway Co.; the Texas & Pacific Railway Co.; the Ohio Bell Telephone Co.; the Youngstown Steel Door Co.; the Steel Co. of Canada, Ltd., and other companies.

During the World War Mr. Dalton was a member of the steel committee of the War Industries Board.

He was twice president of the Interlake Iron Corp., of Chicago, a \$50,000,000 ore carrying and mining company.

In 1925, requested by President Coolidge to make an analysis and report on the status of the merchant marine, he recommended centralizing authority for control and a gradual return to private ownership. President

Hoover named Mr. Dalton to the Advisory Shipping Commission.

Mr. Dalton had long been a patron and supporter of the Cleveland Symphony Orchestra. He was trustee of Western Reserve University, the Cleveland Museum of Art, Trinity Cathedral, Kenyon College and Lakeside Hospital. He belonged to many clubs in Cleveland and New York.

Kenyon College at Gambier, Ohio, to which he gave a science building, conferred the degree of doctor of laws on Mr. Dalton in 1927.

On April 19, 1938, Mr. Dalton's contributions to Cleveland business life and welfare were recognized by the presentation of the Public Service Medal to him by the Cleveland Chamber of Commerce.

... OBITUARY ...

CHARLES H. ERICKSON, vice-president and general superintendent of Cleveland Wire Spring Co., died Dec. 24 at his home in Shaker Heights, suburb of Cleveland, after an illness of three weeks. Born in Sweden, Mr. Erickson was brought to Worcester, Mass., by his parents when he was 18 months old. At the age of 14 he began his career in the steel industry in the mechanical spring department of Washburn & Moen Co., Worcester. He was 60 years old.

UAW Will Scrutinize Foundry Competition

MILWAUKEE—Study of competitive aspects of the foundry industry in this area, which embraces 28 plants in Wisconsin and Illinois, will be undertaken by the newly organized foundry council of locals in the Wisconsin region of the United Automobile Workers union, CIO.

Aaron Luedtke, Racine, Wis., has been elected president of the organization. Other officers are Lester McCallum, Racine, Wis., vice-president; John Jackson, Cicero, Ill., secretary.

Those appointed to the contract research group are Carl Haferkamp, West Allis, Wis.; Ted Turner, Racine, Wis.; Alfred Kesky, Cicero, Ill. The rate information and time study committee consists of McCallum and David Francour of West Allis, Wis., and Ernest Porter, Racine, Wis. The next meeting of the council will be held Jan. 20.

1939 is 4th Highest Year for Domestic Scrap Consumption

By EDWIN C. BARRINGER

Executive Secretary, Institute of Scrap Iron and Steel

NINETEEN thirty-nine was the fourth highest year in history for the iron and steel scrap industry in point of domestic consumption and the second largest for exports.

Domestic consumption, estimated at 34,800,000 gross tons, was exceeded only in 1937, 1936, and 1929. It was within 8½ per cent of the record use of 38,006,272 tons in 1937, and an increase of 62 per cent over 1938.

Exports at approximately 3,500,000 tons compared with 2,998,591 tons in 1938 and the record of 4,092,590 tons in 1937. The increase in exports in 1939 was measurably smaller than that in domestic consumption, and exports amounted to only 9.1 per cent of the total use of scrap, compared with 12.4 per cent in 1938 and 9.7 per cent in 1937.

Of the 1939 consumption, approximately 70 per cent went into the production of new steel, 20 per cent into castings, and 10 per cent for miscellaneous uses.

In 1939, Pennsylvania maintained its pre-eminence as the leading scrap consuming state, accounting for 22 per cent of the domestic total or about 7,650,000 tons. Ohio was second at 19½ per cent or 6,775,000 tons; Indiana third at 77 per cent or 3,800,000 tons; Illinois fourth at 9 per cent or 3,130,000 tons; Michigan fifth at 8½ per cent or 2,950,000 tons; Maryland-Kentucky sixth at 5 per cent or 1,750,000 tons; New York seventh at 4½ per cent or 1,575,000 tons; Alabama eighth at 4 per cent or 1,400,000 tons.

Supplies of scrap are ample for any emergency, according to Mr. Barringer. A Bureau of Mines survey as of Sept. 30, at the close of a month of record shipments, disclosed that stocks in the hands of leading scrap yards, all railroads, and the more important consumers totaled 7,200,000 tons.

In view of the fact that one-half of all scrap consumed is "home" scrap—that is, scrap generated in the process of rolling steel and remelting on the premises—the visible supply at that time could be considered equal to 20 weeks at an abnormally high rate of

consumption. Back of this visible supply is a reservoir of unprepared and uncollected scrap awaiting only a favorable market and an attractive price to bring it out.

An important new trend in 1939 was the increased use of steel scrap by gray iron foundries to impart greater strength and other desirable physical properties to their castings.

Government Orders

WASHINGTON — Government contracts for iron and steel products, as reported for the week ended Dec. 23 by the Labor Department's public contracts division, totaled \$489,679. For the same period contracts for machinery aggregated \$328,439. Details follow:

Iron and Steel Products

Sheffield Steel Corp., Kansas City, Mo., Interior, reinforcement bars	\$12,346.90
Peco Mfg. Corp., Philadelphia, War Ordnance, tubes with disc	27,037.50
Peco Mfg. Corp., Philadelphia, War Ordnance, eyebolt lifting plugs	48,070.50
International Chain & Mfg. Co., York, Pa., Panama Canal, wrought-iron chain	14,448.00
Republic Steel Corp., Cleveland and Buffalo, Panama Canal, concrete-reinforcement bars	32,065.03
Chicago Bridge & Iron Co., Philadelphia, Panama Canal, steel tank	23,150.00
Carolina Steel & Iron Co., Inc., Greensboro, N. C., TVA, bulkhead gates	30,166.20
American Gas Accumulator Co., Elizabeth, N. J., U. S. Coast Guard, acetylene cylinders	51,795.00
American Locomotive Co., Railway Steel-Spring Division, New York City and Latrobe, Pa., War Ordnance, bomb bodies	25,509.75
The Timken Roller Bearing Co., Steel & Tube Division, Canton, Ohio, War Ordnance, steel chromium-molybdenum	17,993.00
Carnegie-Illinois Steel Corp., Chicago, Ill., War Ordnance, steel	11,064.96
Allegheny Ludlum Steel Corp., Brackenridge, Pa., War Ordnance, steel	16,722.61
Morris & Bailey Division, American Steel & Wire Co., Cleveland, War Ordnance, strip steel	16,474.50
Gilbert & Barker Mfg. Co., Springfield, Mass., War Ordnance, water chests	28,727.94
Colonial Supply Co., Louisville, Ky., WPA, reinforcing steel	11,584.59
E. E. Souther Iron Co., St. Louis, WPA, fence	10,693.32
The Frick-Gallagher Mfg. Co., Wellston, Ohio, Navy Purchasing Office, metal bins	13,246.52
National Cylinder Gas Co., Chicago, Navy S & A, gas cylinders	9,984.00
Edward G. Budd Mfg. Co., Philadelphia, Navy S & A, doors and hatches	68,232.46
Lakeside Bridge & Steel Co., Milwaukee, TVA, structural steel	20,367.00

Machinery

United States Hoffman Machinery Corp., New York City, War QMC, extractors, tumblers	\$10,408.00
The Fairbanks Co., New York City, Binghamton, N. Y., Navy Purchasing Office, bronze valves	16,179.50
Marshall & Huschart Machinery Co., Chicago, War Ordnance, hydraulic press	12,143.00
Wm. Sellers & Co., Inc., Philadelphia, War Ordnance, grinding machines	10,526.00
Brown & Sharpe Mfg. Co., Providence, R. I., War Ordnance, screw machines	27,132.00
H. R. Krueger & Co., Detroit, War Ordnance, fixtures, miscellaneous	10,160.00
Brown & Sharpe Mfg. Co., Providence, R. I., War Ordnance, grinding machines	18,025.00
The Billings & Spencer Co., Hartford, Conn., War Ordnance, drop hammers	28,681.00
Austin-Hastings Co., Inc., Cambridge, Mass., War Ordnance, turning lathe	55,000.00
Cincinnati Milling Machine & Cincinnati Grinders, Inc., Cincinnati, War Ordnance, milling machines	40,957.20
Crane Co., Chicago, Ill., Navy Purchasing Office, valves	24,437.50
Copeland Refrigeration Corp., Sidney, Ohio, Navy S & A, refrigerators	15,216.00
The Ajax Mfg. Co., Cleveland, Navy S & A, upsetting-forging machine	36,275.00
H. B. Underwood Corp., Philadelphia, Navy S & A, milling machines	13,060.00
R. G. LeTourneau, Inc., Peoria, Ill., Panama Canal, scrapers	10,239.00

Ickes Sees Aluminum Deal Justifying U. S. Power Projects

WASHINGTON — Secretary of Interior Harold L. Ickes, who is anxious to justify the construction of New Deal power projects and who shares President Roosevelt's interest in encouraging the construction of additional steel facilities on the Pacific Coast, last week pointed to a 20-year contract signed by the Aluminum Co. of America for a substantial block of power from the government-owned Bonneville dam as indicative that new industry will move to "vast new power sources in the Northwest."

While Mr. Ickes noted that "other proposed contracts for the sale of Bonneville power to industry working with metals are under active negotiation," he did not divulge further details. In an effort to break down the claim that there is no real demand for power from government-owned plants on the Columbia River, the Secretary of Interior added:

"The Pacific Northwest at the present affords a new and reliable source of adequate cheap power for future expansion of heavy industries, requiring large amounts of electrical energy in their manufacturing operation. The way is open for new industrial expansion in the Pacific Northwest. Development of this and other new industries in the area means new pay rolls and new markets for the merchant and farmer. This is only the beginning."